

METADATA FRAMEWORK DATA DICTIONARY

INSTALLATION AND USER GUIDE



METADATA FRAMEWORK DATA DICTIONARY

DESCRIPTION

The Metadata Framework Data Dictionary application (MFDD) was created to allow a user to explore the metadata of their databases. A user can parse out the contents of any SQL Server Data Warehouse or Cube and look at the measures, measure groups, and associations that are present.

Why is this important?

For the purposes of Business Intelligence , a company can have many sources of data that they would like to put together and analyze patterns, trends, or parallels; they can extract data from different systems, create reports on it, and see information outside the design of the original database.

In the Microsoft world, this is accomplished by building SQL Server Analysis Services cubes on top of a data warehouse that can relate to data in more business friendly terms for the target audience.

There are many hierarchies that you can structure into your description of the business in your cube; once described you can start measuring these aspects of your business (how many sold, forecasts, sales, etc.)

This data can come out of the cube and be presented using various mediums, such as Microsoft Excel, SQL Server Reporting Services, or on screen dashboards using SharePoint.

What's missing here is that if a user is new to the system, there is nothing in place to describe the metadata; the metadata is the information 'about' the information; where it came from, how it got to be there, what does it mean. Information may not match, for example, across some systems. 'Profit' from a sales perspective is different than the accounting aspect; this application provides visibility to the entire data view with a user interface built in Silverlight.

Terminology relevant to the application:

The "dictionary" is the lump sum of the information; it is the collection of 'terms' that are agreed upon during the analysis.

The "source systems" are the external databases.

The "measures" are the cubes.

The "applications" are the ways to display the information (Excel, SharePoint)

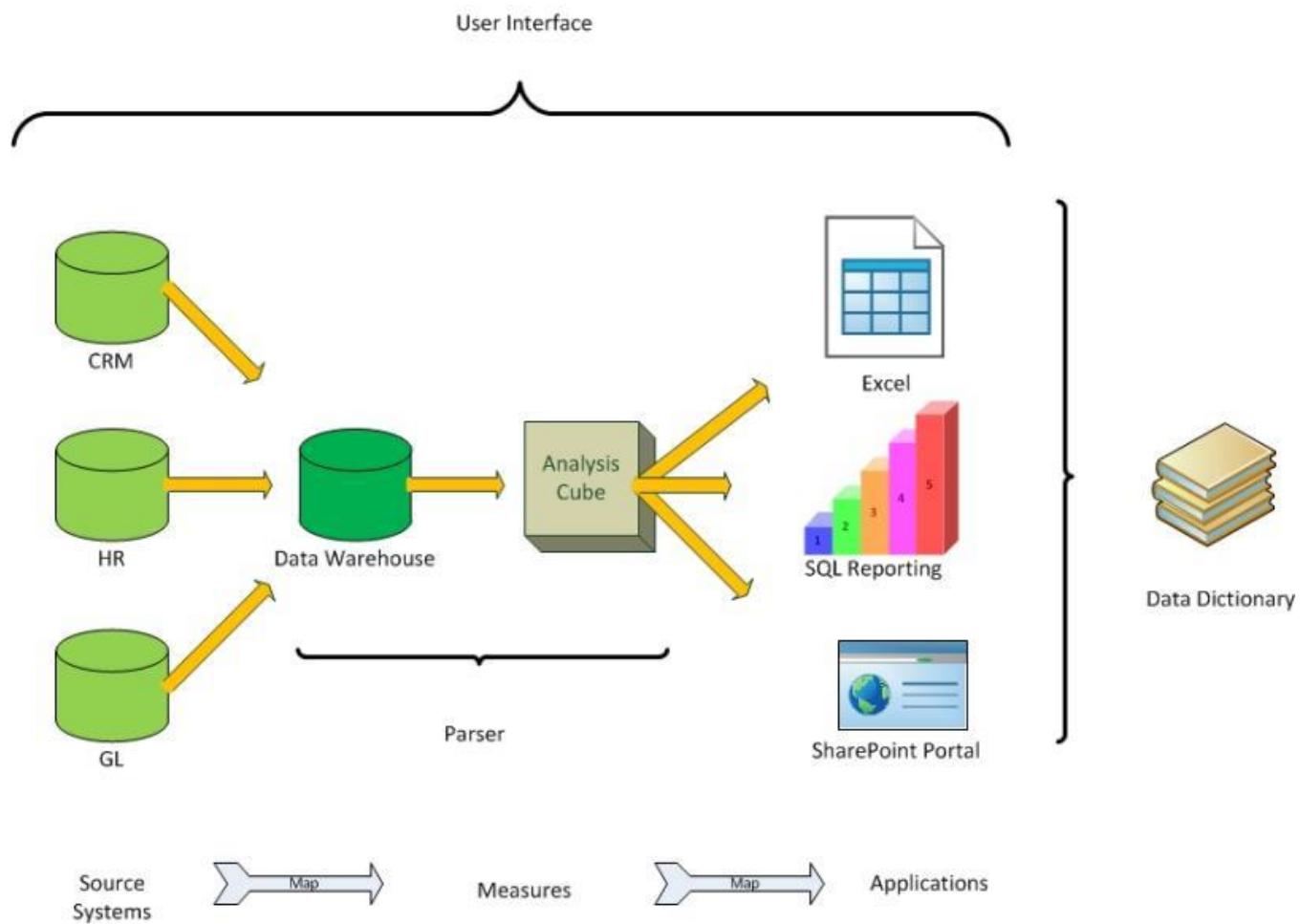
There are screens in place that allow mapping of components to components; you establish your entities, you define them, and then you map them together so that you can see the entire chain.



The parser application (the Admin button) automates the aspect of pulling the measures out of the data warehouse / cube; you can choose which terms to map or orphan those that you do not want to use.

This tool should be deployed as part of a BI implementation as the user manual on the product; you've built something and the user can now see what has been delivered.

The diagram below explains the associations between the tool and the BI stack



INSTALLATION

On Windows Server 2008R2 with IIS installed, and SQL 2008R2 installed, also install the following:

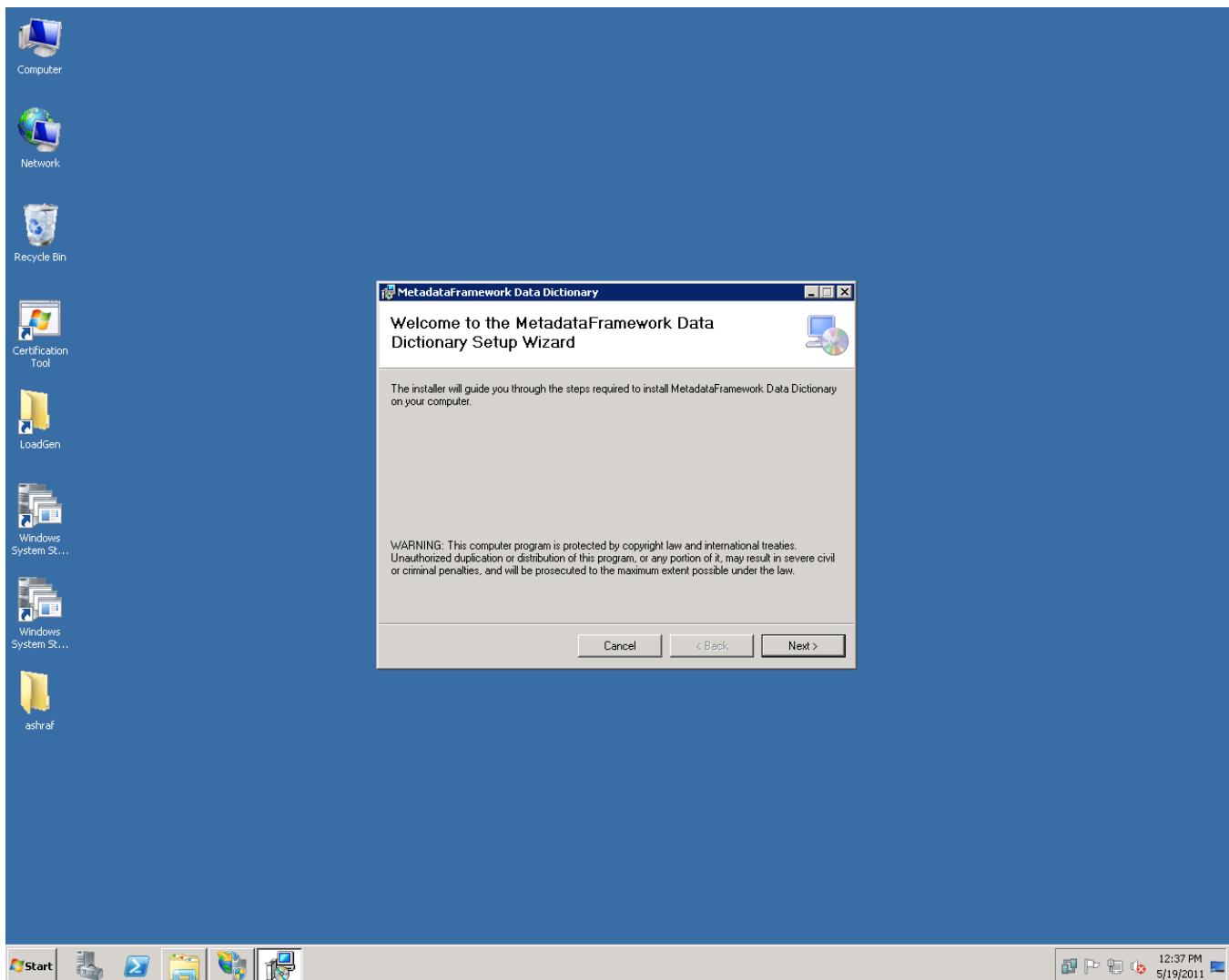
- Microsoft .NET v4 Framework
(<http://www.microsoft.com/downloads/details.aspx?familyid=9cfb2d51-5ff4-4491-b0e5-b386f32c0992>)
- Silverlight 4.0 SDK
(<http://www.microsoft.com/downloads/en/details.aspx?FamilyID=298170d6-567c-4b90-9917-490ffcddba87&displaylang=en>)
- Silverlight 4 developer runtime (<http://go.microsoft.com/fwlink/?LinkId=146060>)

Once completed, run Setup.exe.

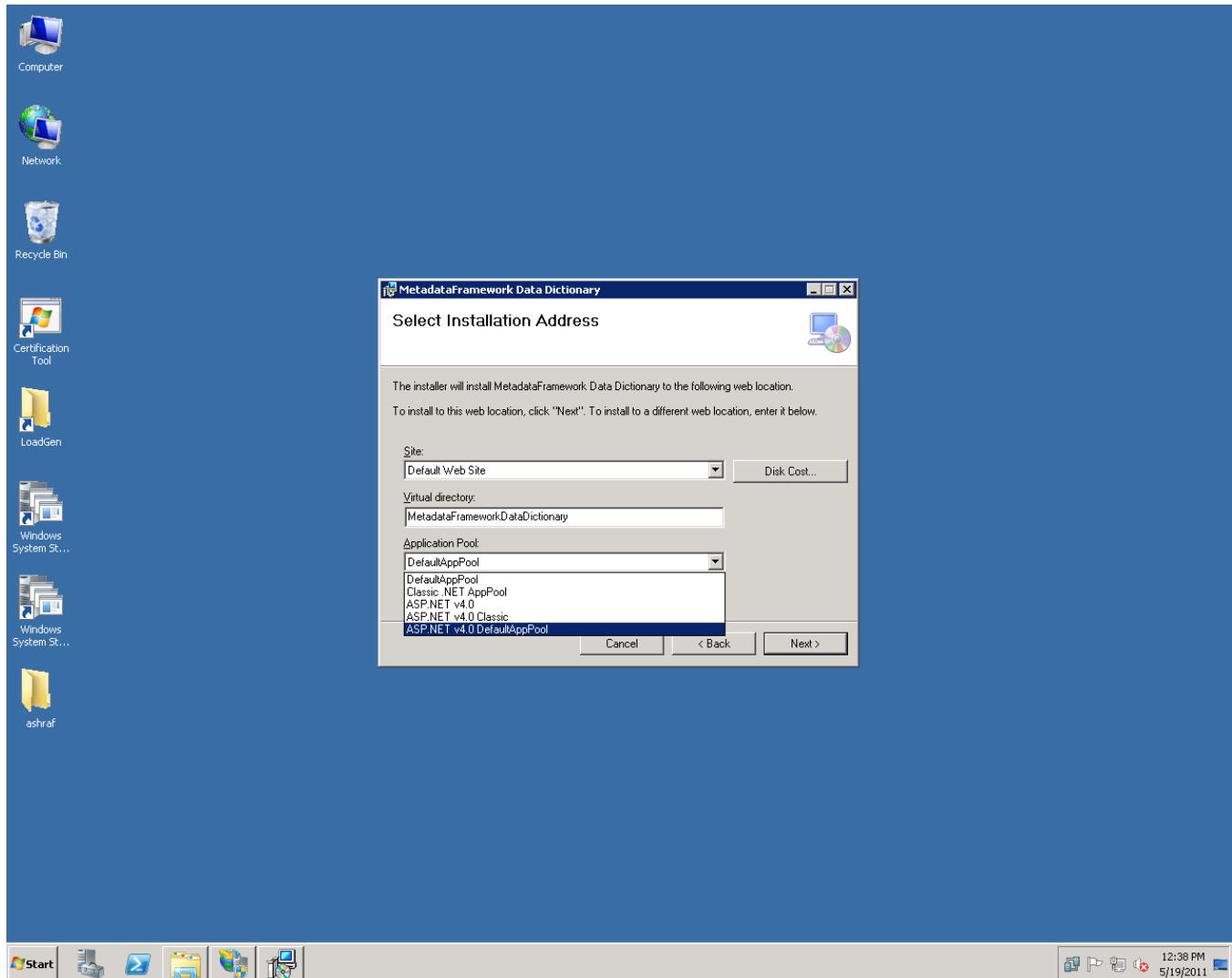
The installer goes through a number of steps when run:

1. The installer checks to see if the correct version of Windows is running by checking the WindowsBuild Operating System Value being greater than 7100
([http://msdn.microsoft.com/en-us/library/aa370556\(VS.85\).aspx](http://msdn.microsoft.com/en-us/library/aa370556(VS.85).aspx))
2. Checks to see if the Event Log contains the event source name for the application. If not, create it under the raised privileges during install
3. Writes to the Event Log during setup when the database is installed and when the application is installed
4. Installs the database in the local instance of SQL Server
5. Installs the application

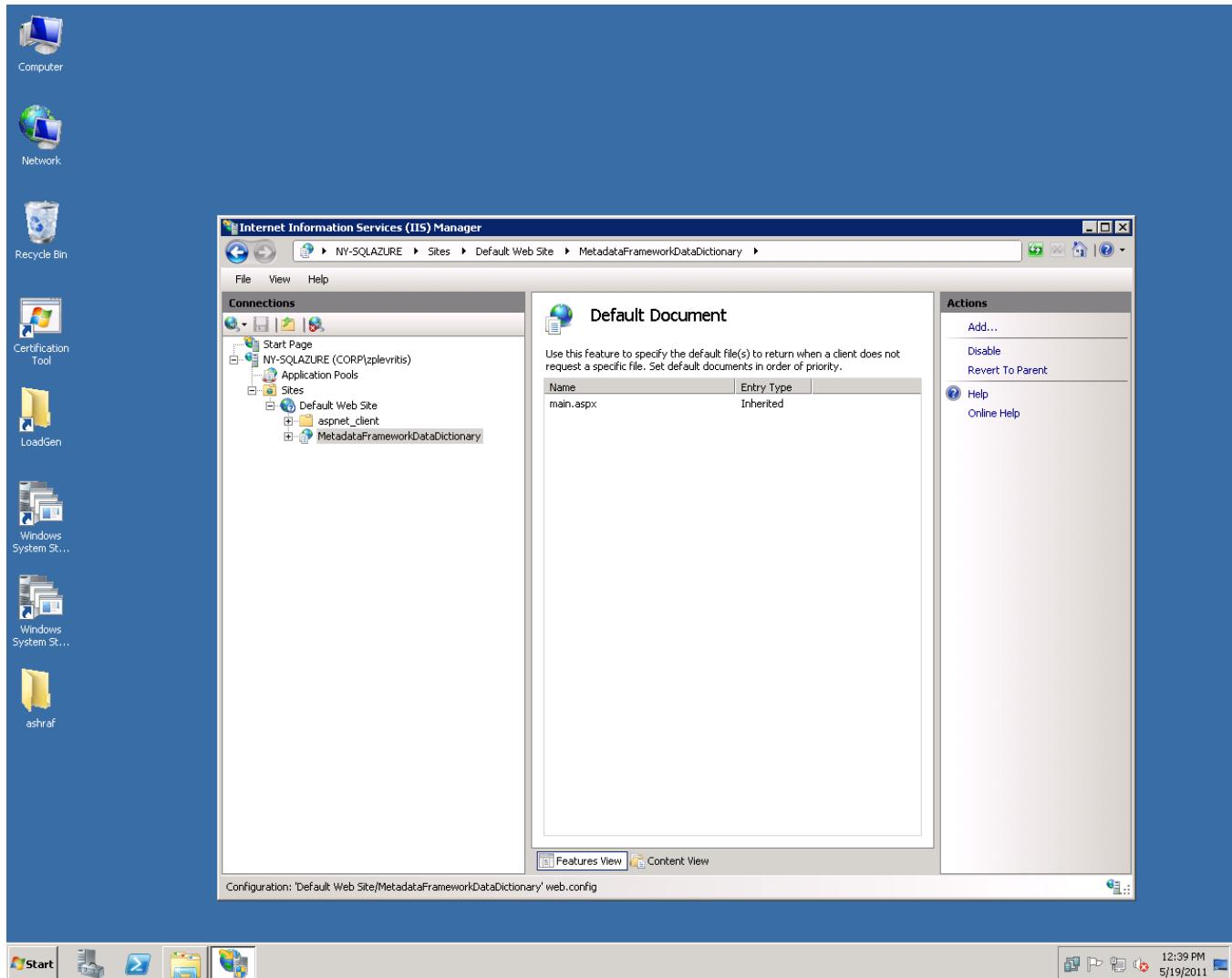
Note: This is an IIS application. It requires IIS to be running on the host server in order for it to run. Windows Server 2008R2 supports booting into Safe Mode, which does not allow the web services to run. Therefore, this application does not run in safe mode.



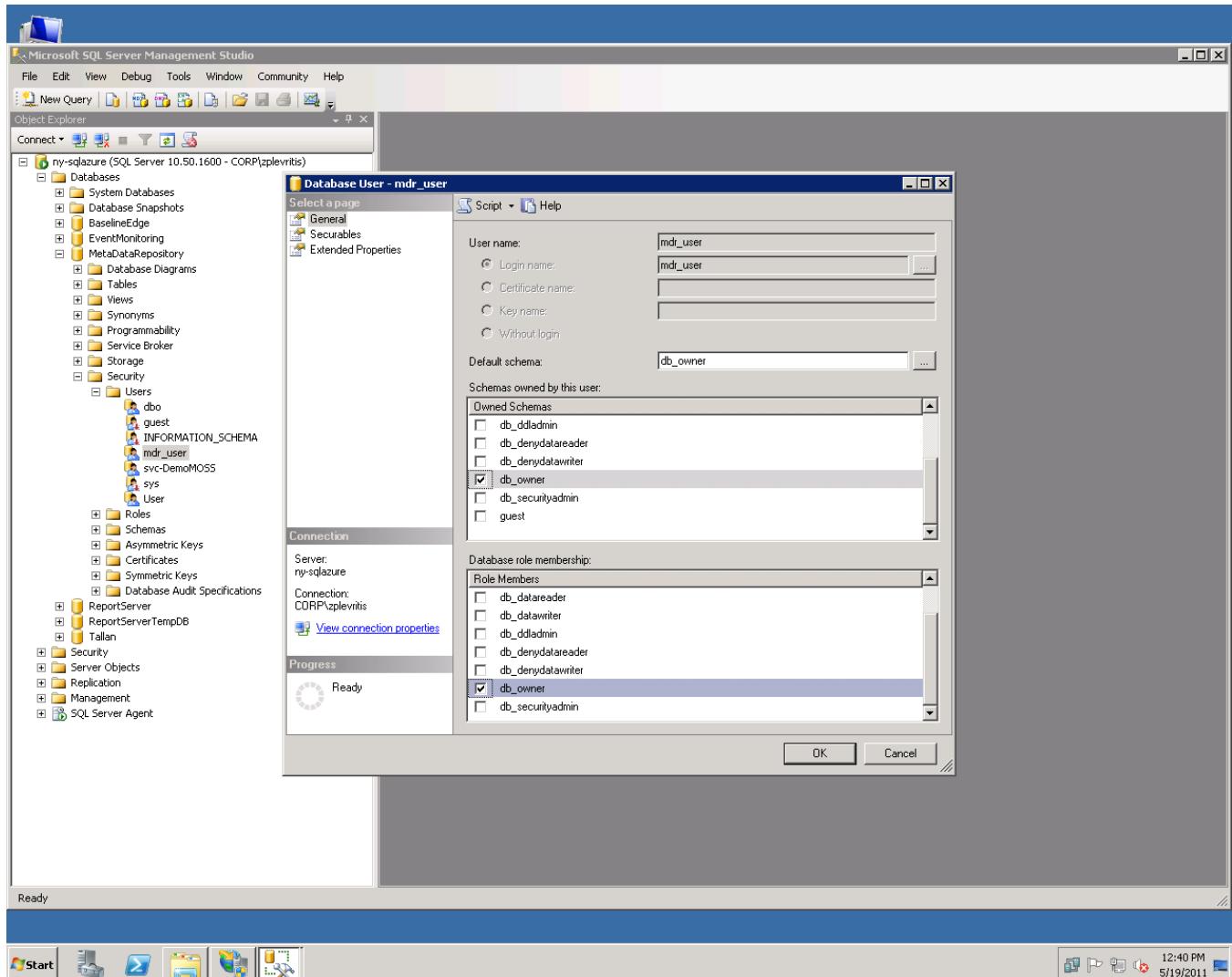
Make certain to choose an App pool that is running the ASP.NET v4; you can accept the default pool created when the .NET 4 Framework was installed, or, create a new one



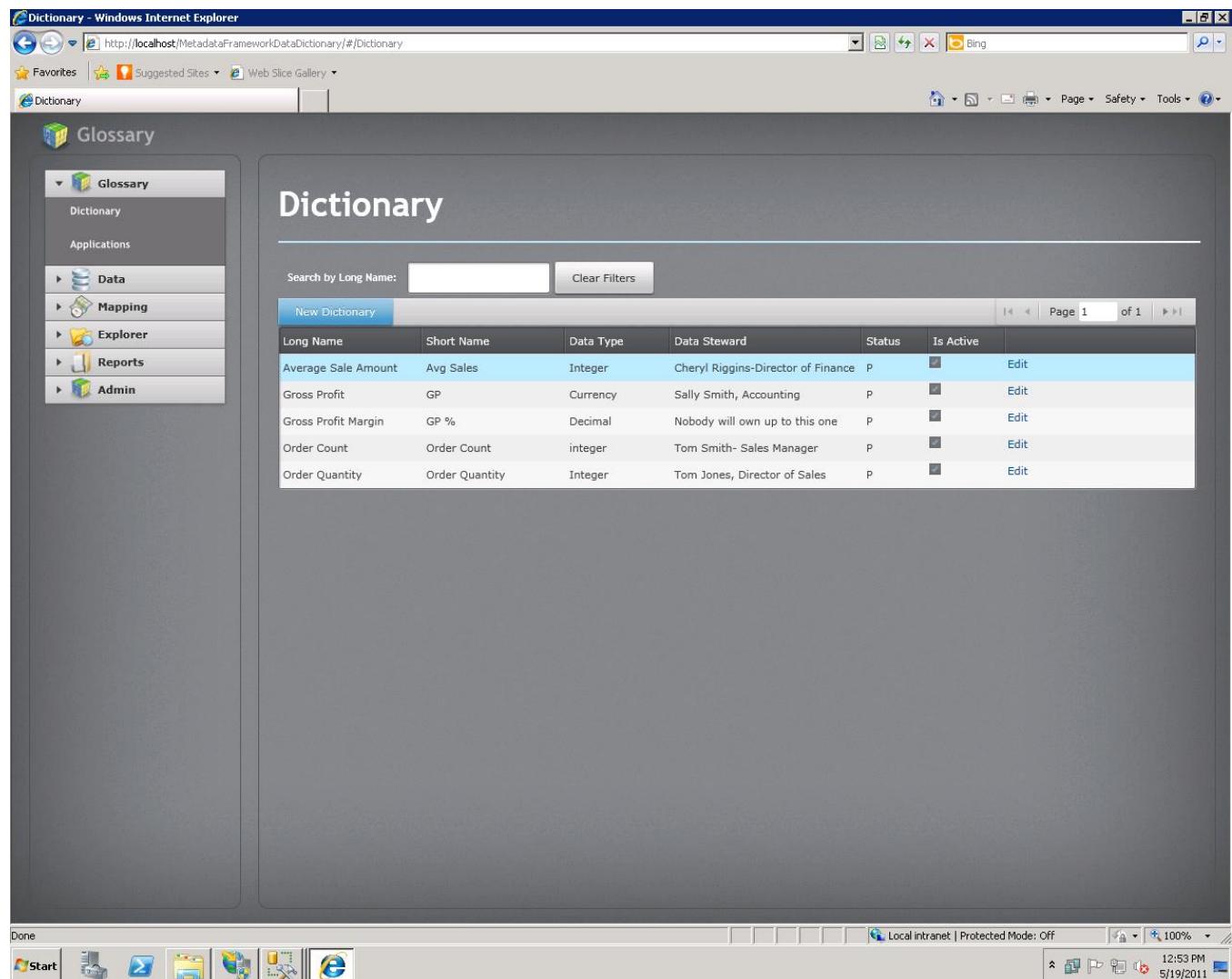
Once installed, make certain the default document for the new application points to main.aspx



Open up SQL Management Studio, and grant DB_Owner rights to user MDR_User as a security object inside the MetaDataRepository database



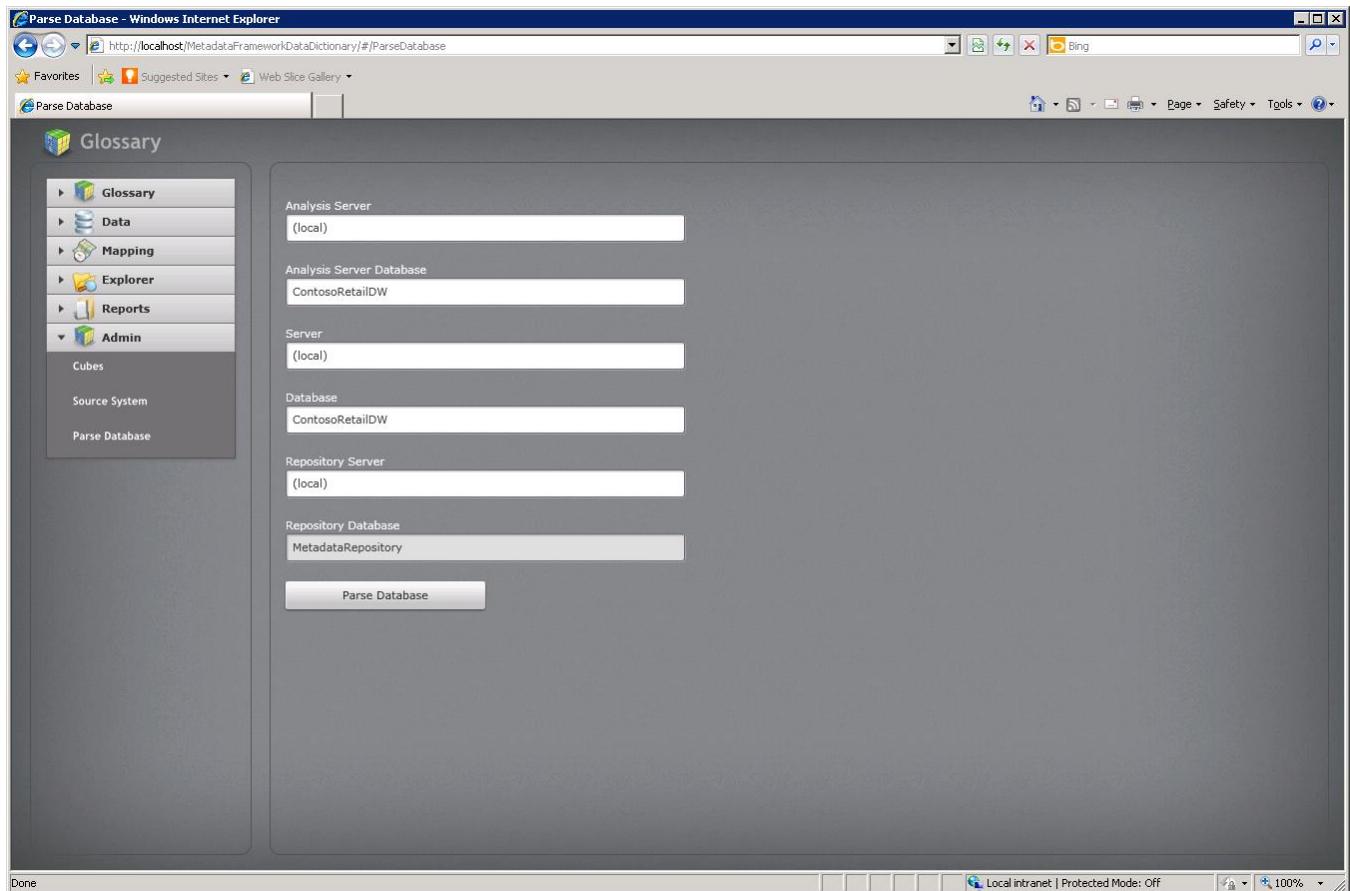
App should load up like this:



The screenshot shows a Windows Internet Explorer window displaying the 'Dictionary' page of the Metadata Framework Data Dictionary. The URL in the address bar is <http://localhost/MetadataFrameworkDataDictionary/#/Dictionary>. The browser interface includes a toolbar with Back, Forward, Stop, Refresh, and Favorites buttons. The main content area is titled 'Dictionary' and contains a table of data. The table has columns: Long Name, Short Name, Data Type, Data Steward, Status, and Is Active. The table data is as follows:

Long Name	Short Name	Data Type	Data Steward	Status	Is Active	Action
Average Sale Amount	Avg Sales	Integer	Cheryl Riggins-Director of Finance	P	<input checked="" type="checkbox"/>	Edit
Gross Profit	GP	Currency	Sally Smith, Accounting	P	<input checked="" type="checkbox"/>	Edit
Gross Profit Margin	GP %	Decimal	Nobody will own up to this one	P	<input checked="" type="checkbox"/>	Edit
Order Count	Order Count	integer	Tom Smith- Sales Manager	P	<input checked="" type="checkbox"/>	Edit
Order Quantity	Order Quantity	Integer	Tom Jones, Director of Sales	P	<input checked="" type="checkbox"/>	Edit

Admin Options



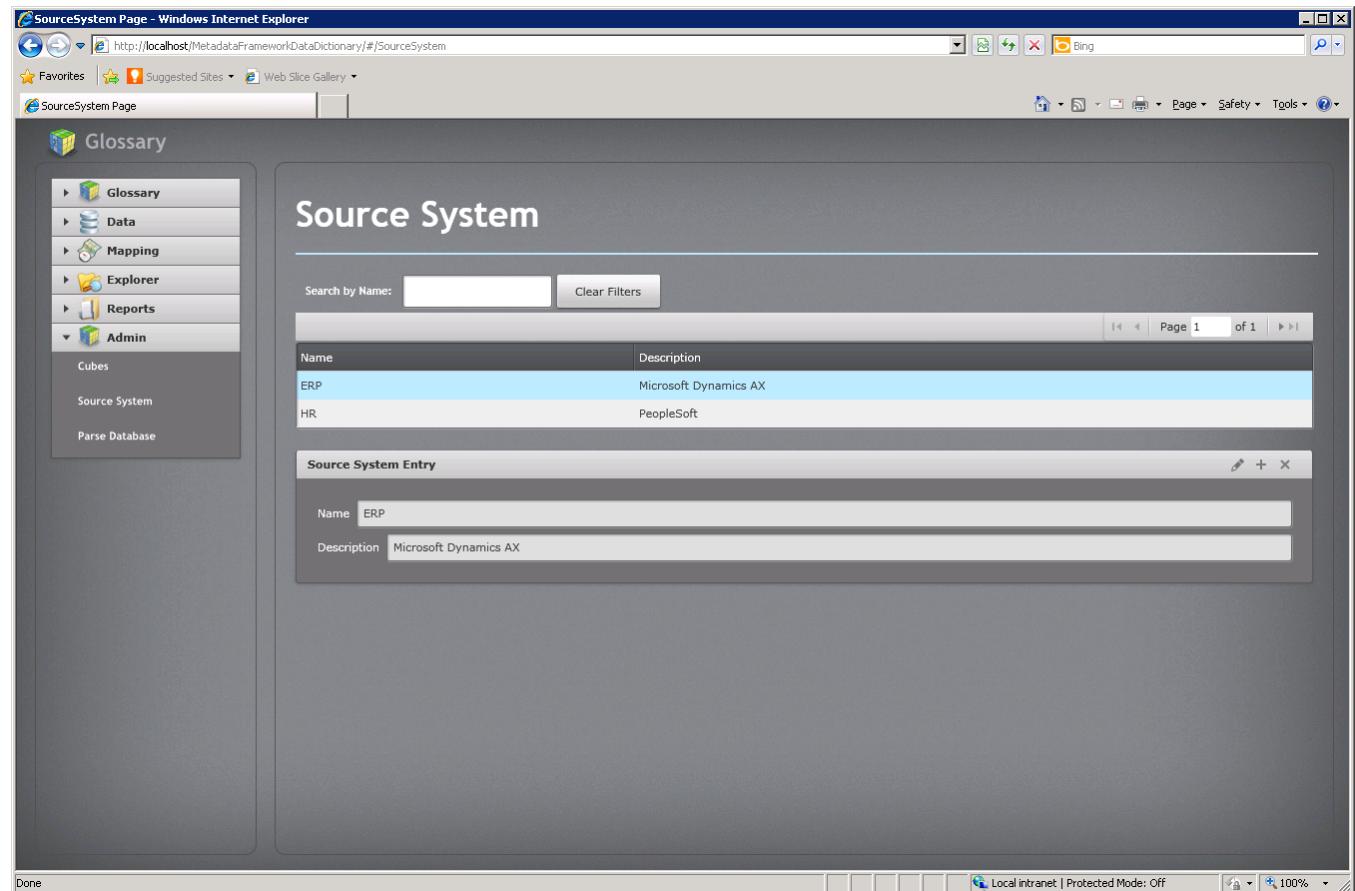
This is the **Parse Database** screen. In this screen we see that there are six text boxes altogether, with five editable. The text boxes are as follows:

- i. **Analysis Server** - this is the name of the SQL Server Analysis Server where the Analysis Server database that will be scraped lives
- ii. **Analysis Server Database** - this is the database for which the Analysis Server information will be scraped
- iii. **Server** - this is the name of the SQL Server instance where the database that will be scraped lives (should be identical to the Analysis Server information)
- iv. **Database** - this is the database that will be scraped for information (should be identical to the Analysis Server Database information)
- v. **Repository Server** - this is the SQL Server instance name where the repository database lives.

By default, it is assumed that the application lives on the same box as the application, so "**(local)**" is automatically filled in for each of the server text boxes.

This feature allows a user/administrator to enter the server and database that they would like to scrape for information. By clicking "**Parse Database**" you add the information from the target databases to the **MetadataRepository** database.

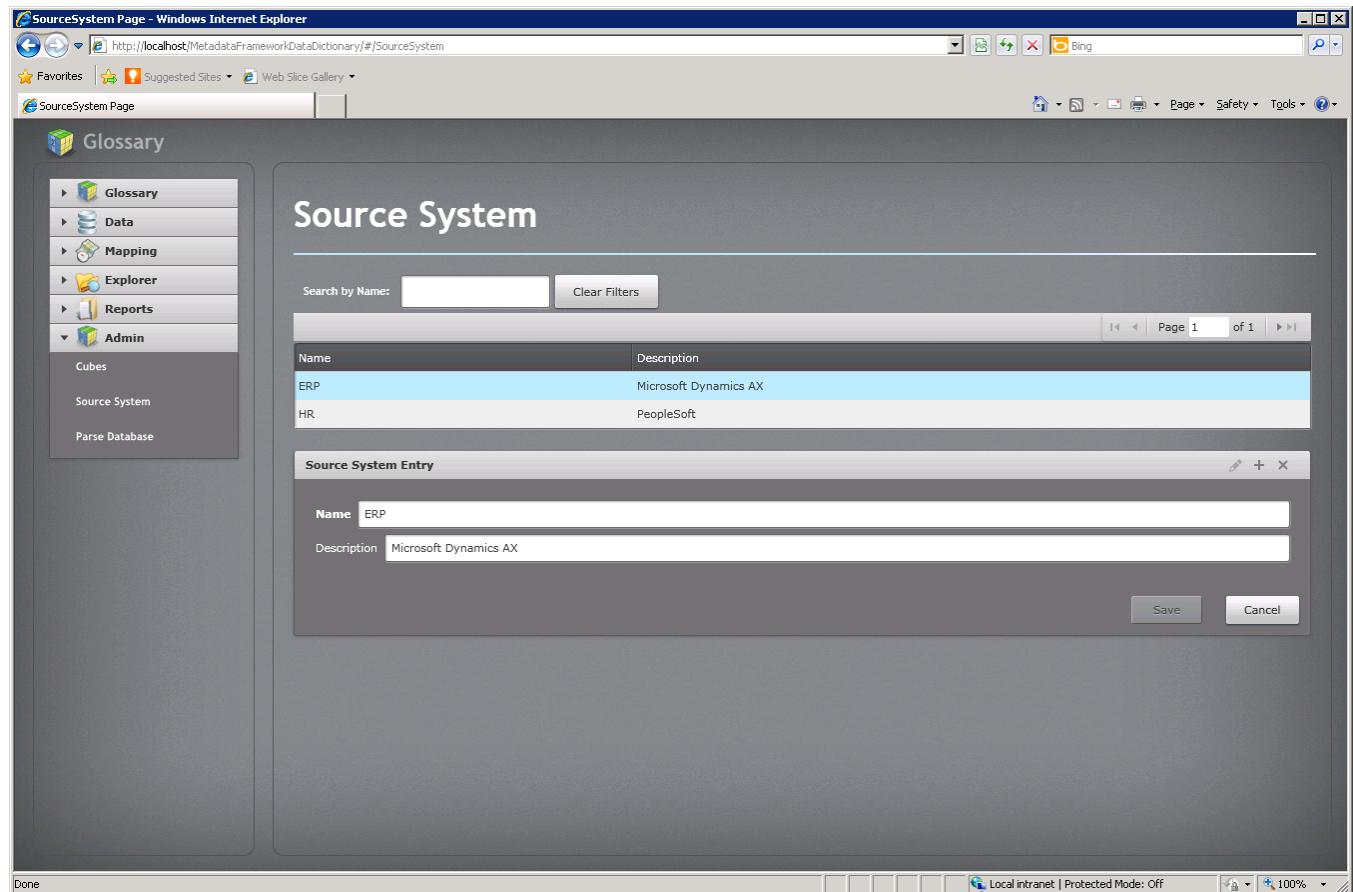




This is the **Source System** screen. This screen allows you to add, edit, and view information on Source Systems used in the organization. Here, we see that the corporation is running Microsoft Dynamics AX as the ERP system and PeopleSoft as their HR system. In this example, ERP/Microsoft Dynamics AX is selected and its information is listed in a child window below it. On the right hand side there are three buttons, edit, add, and delete.

- i. Clicking on the edit button we get the below screen. The Save button becomes disabled until a change is made. The cancel button is active.
- ii. Add is similar, except that the Name and Description text boxes are blank.
- iii. Delete asks whether or not you would like to delete the record. If you click yes the data is deleted, otherwise the data is persisted.

Notice that you can also filter results in the table using the "**Search by Name**" box. For example, if you typed "ERP" and clicked the **Filter** button, ERP would be the only item in the result table.

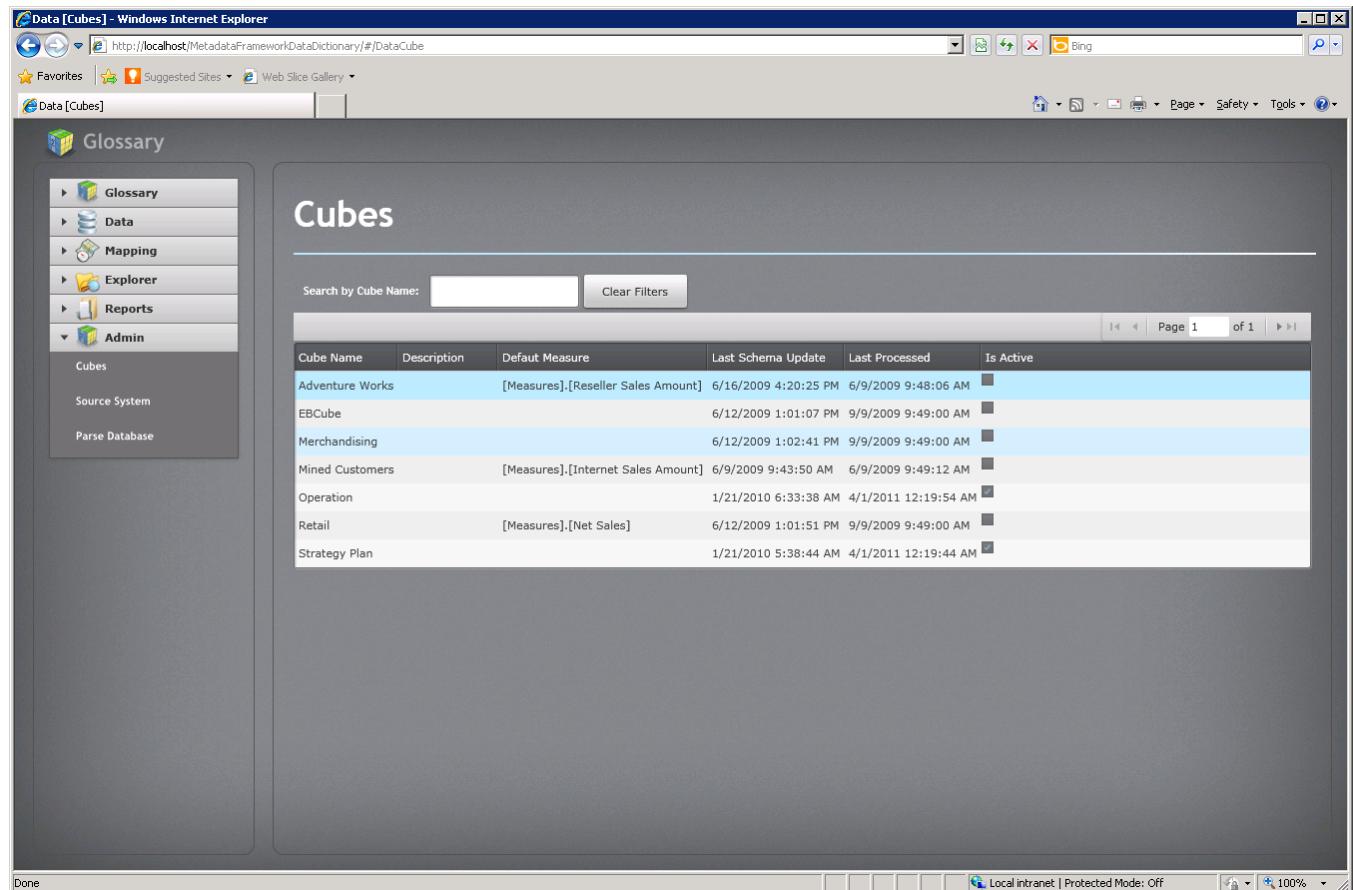


The screenshot shows a Windows Internet Explorer window titled "SourceSystem Page - Windows Internet Explorer". The URL in the address bar is <http://localhost/MetadataFrameworkDataDictionary/#/SourceSystem>. The page content is titled "Source System". On the left, there is a navigation menu with items: Glossary, Data, Mapping, Explorer, Reports, Admin (with sub-items Cubes, Source System, Parse Database). The main area shows a table titled "Source System Entry" with two rows:

Name	Description
ERP	Microsoft Dynamics AX
HR	PeopleSoft

Below the table, there is a modal dialog titled "Source System Entry" with fields: Name (ERP), Description (Microsoft Dynamics AX), Save, and Cancel buttons. The status bar at the bottom of the browser window shows "Local intranet | Protected Mode: Off" and "100%".

(edit screen)



The screenshot shows a Microsoft Internet Explorer window with the title 'Data [Cubes] - Windows Internet Explorer'. The URL in the address bar is 'http://localhost/MetadataFrameworkDataDictionary/#/DataCube'. The page content is titled 'Cubes'. On the left, there is a navigation sidebar with the following menu items: Glossary, Data, Mapping, Explorer, Reports, and Admin. Under Admin, there are three sub-items: Cubes, Source System, and Parse Database. The main content area displays a table with the following data:

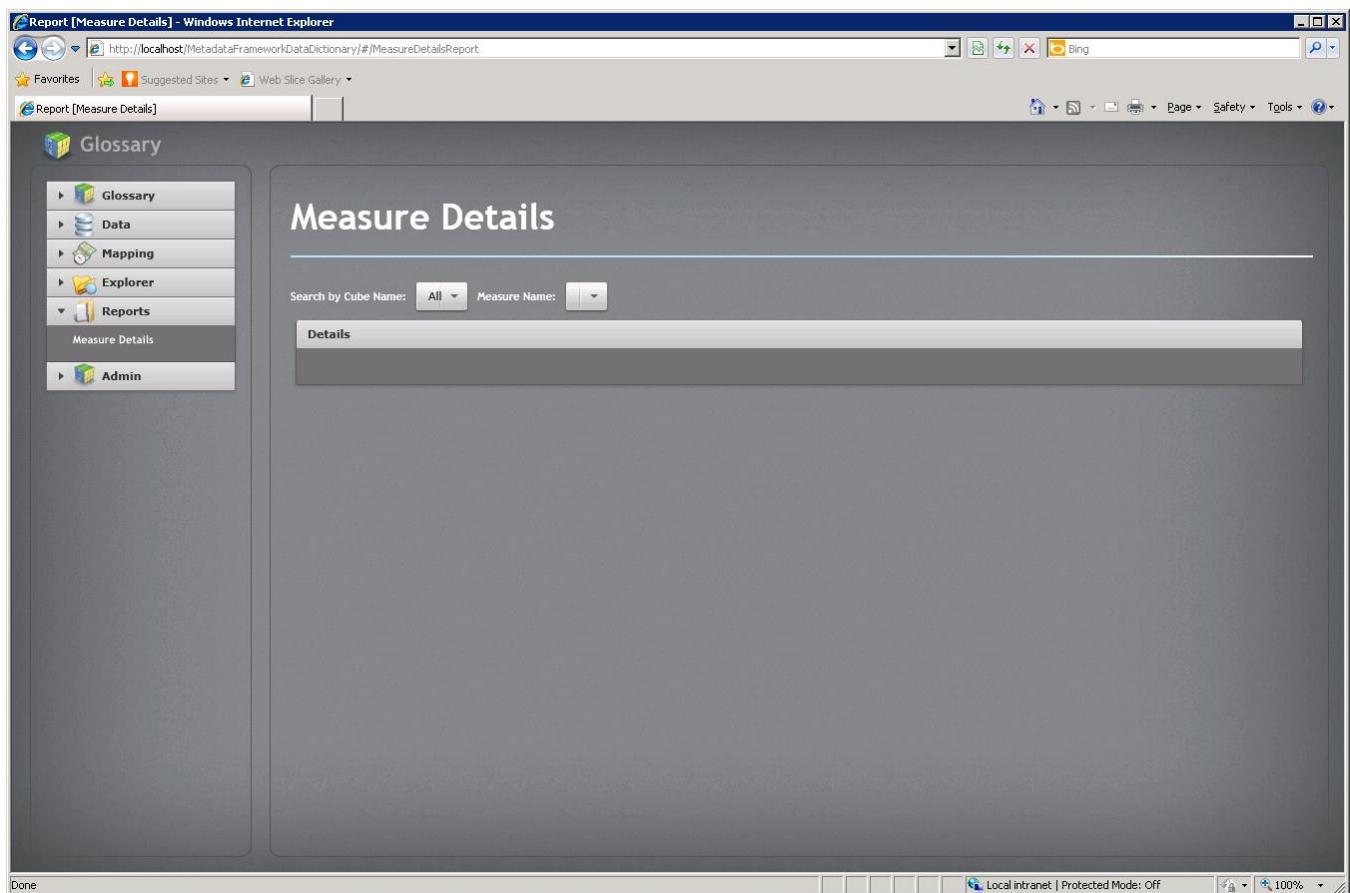
Cube Name	Description	Default Measure	Last Schema Update	Last Processed	Is Active
Adventure Works		[Measures].[Reseller Sales Amount]	6/16/2009 4:20:25 PM	6/9/2009 9:48:06 AM	■
EBCube			6/12/2009 1:01:07 PM	9/9/2009 9:49:00 AM	■
Merchandising			6/12/2009 1:02:41 PM	9/9/2009 9:49:00 AM	■
Mined Customers		[Measures].[Internet Sales Amount]	6/9/2009 9:43:50 AM	6/9/2009 9:49:12 AM	■
Operation			1/21/2010 6:33:38 AM	4/1/2011 12:19:54 AM	■
Retail		[Measures].[Net Sales]	6/12/2009 1:01:51 PM	9/9/2009 9:49:00 AM	■
Strategy Plan			1/21/2010 5:38:44 AM	4/1/2011 12:19:44 AM	■

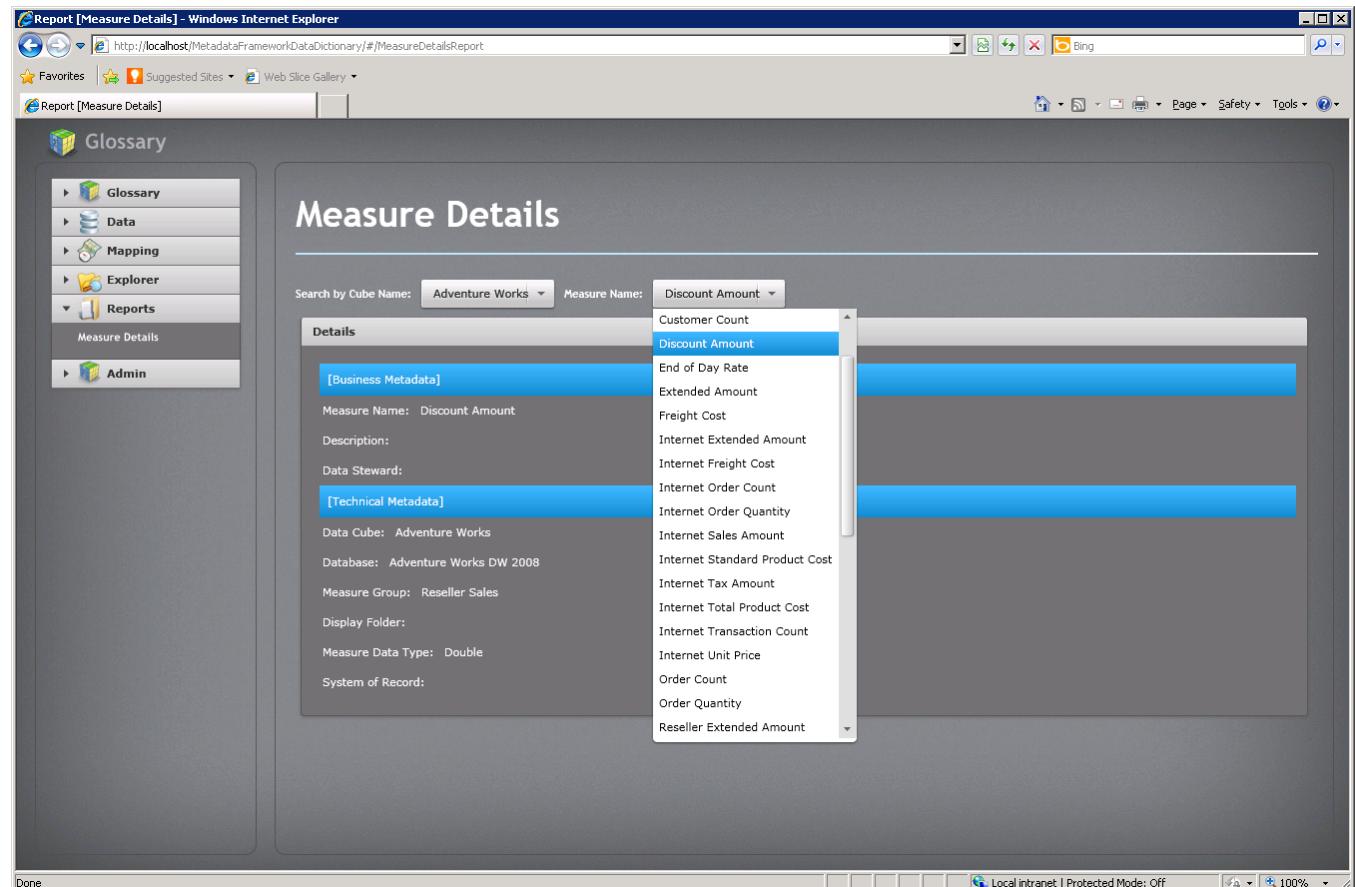
This is the Cubes screen. Here we have information related to the cubes in the SQL Server databases whose data has been scraped and imported into the MetadataRepository database. This screen is read-only and displays such information as the cube name, description and default measure.

Notice that you can also filter results in the table using the "Search by Name" box.

Reports Option

The **Measures Details** screen under the **Reports** option is a read-only screen that displays measure information for each of the cubes in the database. Initially, the Measures Details screen is blank, awaiting options selections by the user, as in the first screen. The second screen shows measures details for the "Discount Amount" measure under the Adventure Works cube. Notice that the drop down box is visible in the second screen showing the other measure names in the Adventure Works cube. The technical and business information for the previously chosen "**Discount Amount**" is listed in the screen.





The screenshot shows a Microsoft Internet Explorer window displaying the 'Measure Details' report from the Metadata Framework Data Dictionary. The URL in the address bar is <http://localhost/MetadataFrameworkDataDictionary/#/MeasureDetailsReport>. The left sidebar contains a navigation menu with links to 'Glossary', 'Data', 'Mapping', 'Explorer', 'Reports', 'Measure Details' (which is selected and highlighted in blue), and 'Admin'. The main content area is titled 'Measure Details' and includes a search bar for 'Search by Cube Name' (set to 'Adventure Works') and a dropdown for 'Measure Name' (set to 'Discount Amount'). A detailed list of measure metadata is shown, categorized into 'Business Metadata' and 'Technical Metadata'. The 'Business Metadata' section includes fields like Measure Name, Description, Data Steward, and Display Folder. The 'Technical Metadata' section includes fields like Data Cube, Database, Measure Group, Measure Data Type, and System of Record. A dropdown menu is open over the 'Measure Name' dropdown, listing various measure names such as 'Customer Count', 'Discount Amount', 'End of Day Rate', 'Extended Amount', 'Freight Cost', 'Internet Extended Amount', 'Internet Freight Cost', 'Internet Order Count', 'Internet Order Quantity', 'Internet Sales Amount', 'Internet Standard Product Cost', 'Internet Tax Amount', 'Internet Total Product Cost', 'Internet Transaction Count', 'Internet Unit Price', 'Order Count', 'Order Quantity', and 'Reseller Extended Amount'. The 'Discount Amount' option is currently selected. The bottom of the browser window shows standard Internet Explorer controls and status information.



Explorer Options

The **Measures** screen within the **Explorer** option allows a read-only view of the measures with the organization's databases in the form of a tree control that shows information in the following hierarchy:

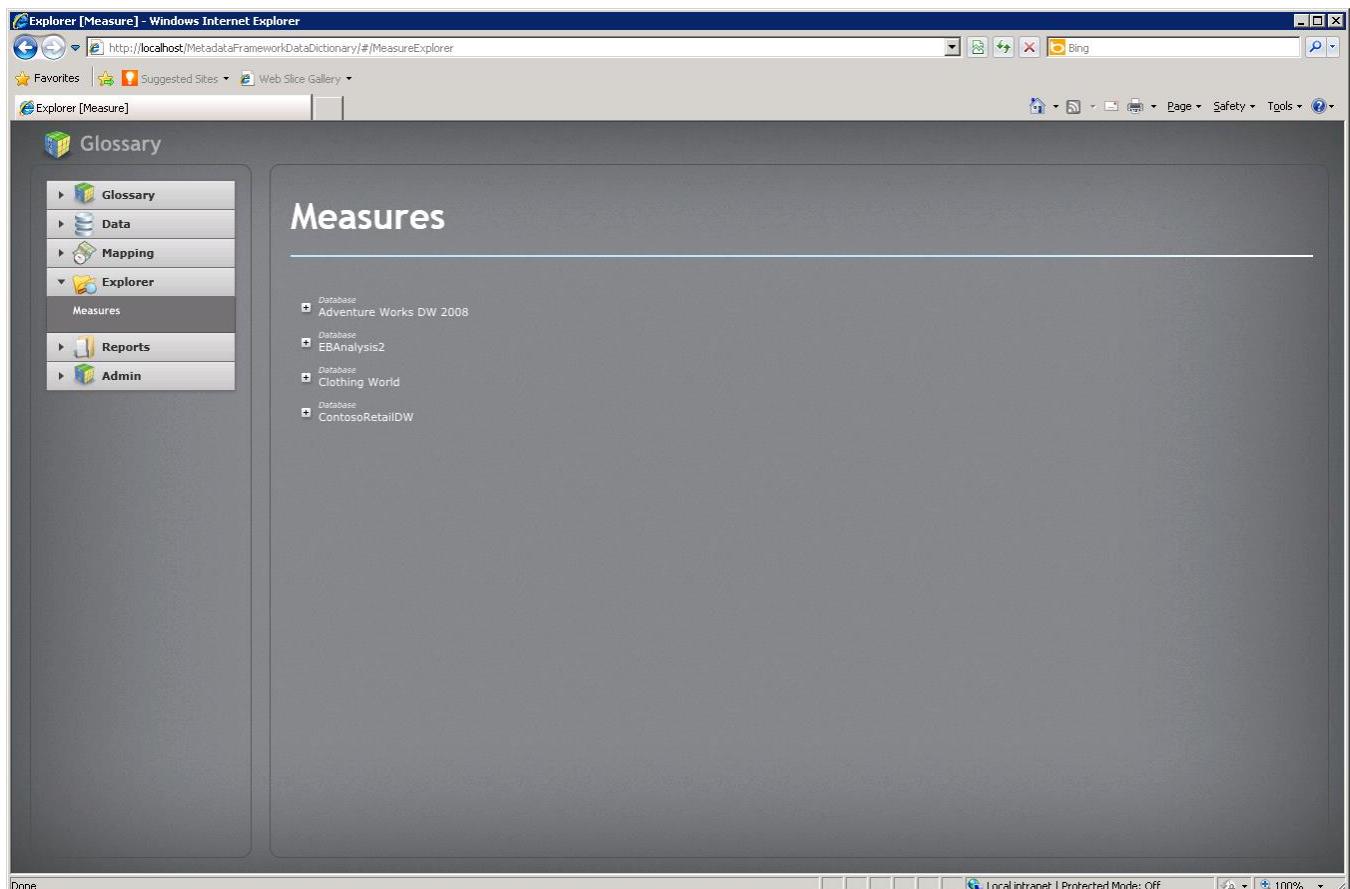
- i. Database
 - a. Cube
 - i. Measure Group
 - 1. Measure

In the first screen below, notice that the default view shows the tree structure containing the databases that have been scraped.

In the second screen we see the Contoso DW and Adventure Works DW 2008 databases have been drilled down to different levels, with the Adventure Works Mined Customers cube selected. It's information is on the right.

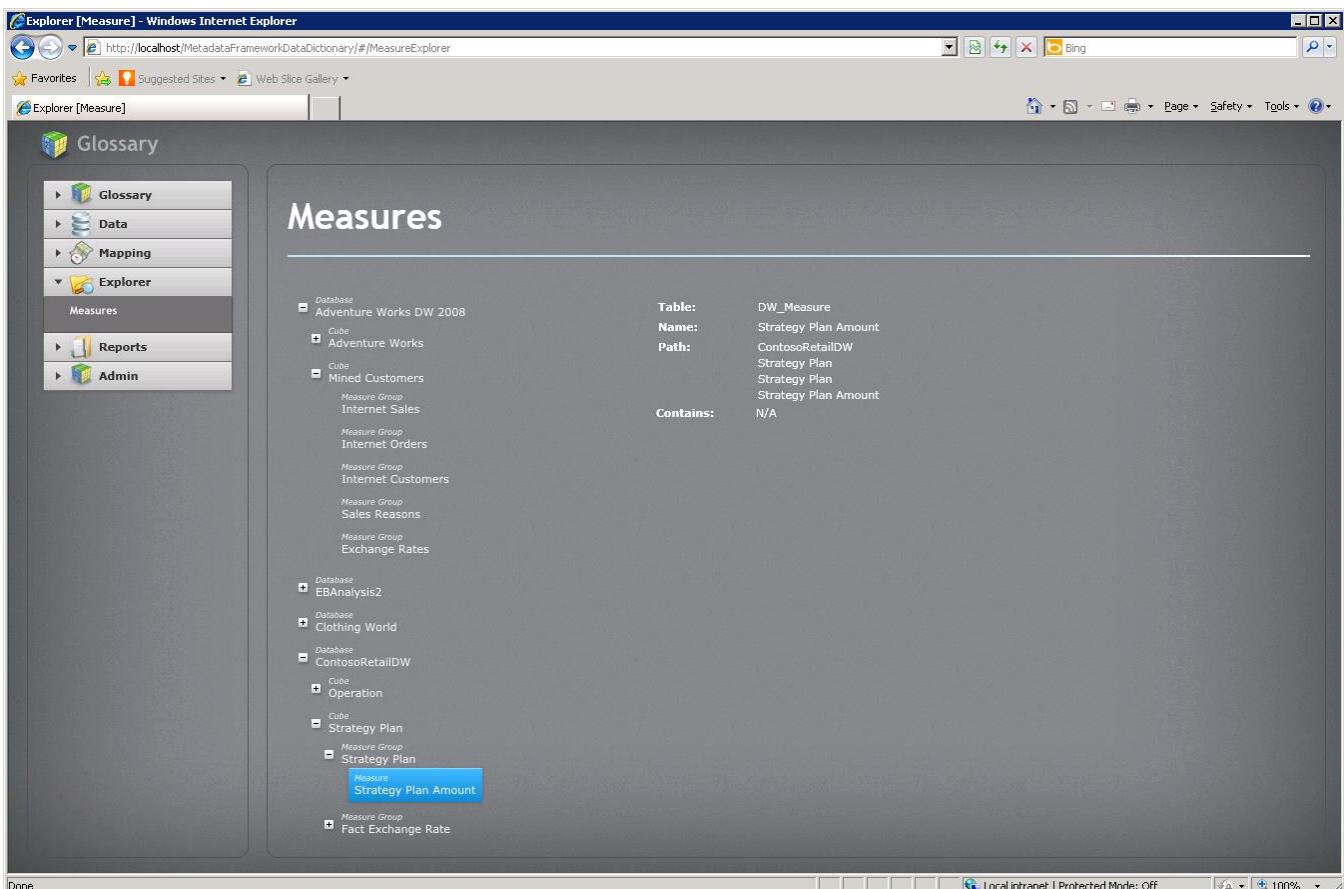
In the last screen we have drilled down to a measure in the Contoso DW database, with the information for that measure displayed on the right hand side.





Measures

Table: DW_Cube
Name: Mined Customers
Path: Adventure Works DW 2008 / Mined Customers
Contains: 5 Measure Group(s)



The screenshot shows the 'Measure Explorer' interface within a Microsoft Internet Explorer window. The title bar reads 'Explorer [Measure] - Windows Internet Explorer' and the address bar shows 'http://localhost/MetadataFrameworkDataDictionary/#/MeasureExplorer'. The left sidebar contains a navigation tree with 'Glossary', 'Data', 'Mapping', 'Explorer' (which is expanded to show 'Measures'), 'Reports', and 'Admin'. The main content area is titled 'Measures'. On the left, a detailed tree view shows the structure of databases, cubes, and measures. A specific measure, 'Strategy Plan Amount' under the 'ContosoRetailDW' cube, is highlighted with a blue selection box. To the right of this tree, a table provides detailed information about the selected measure:

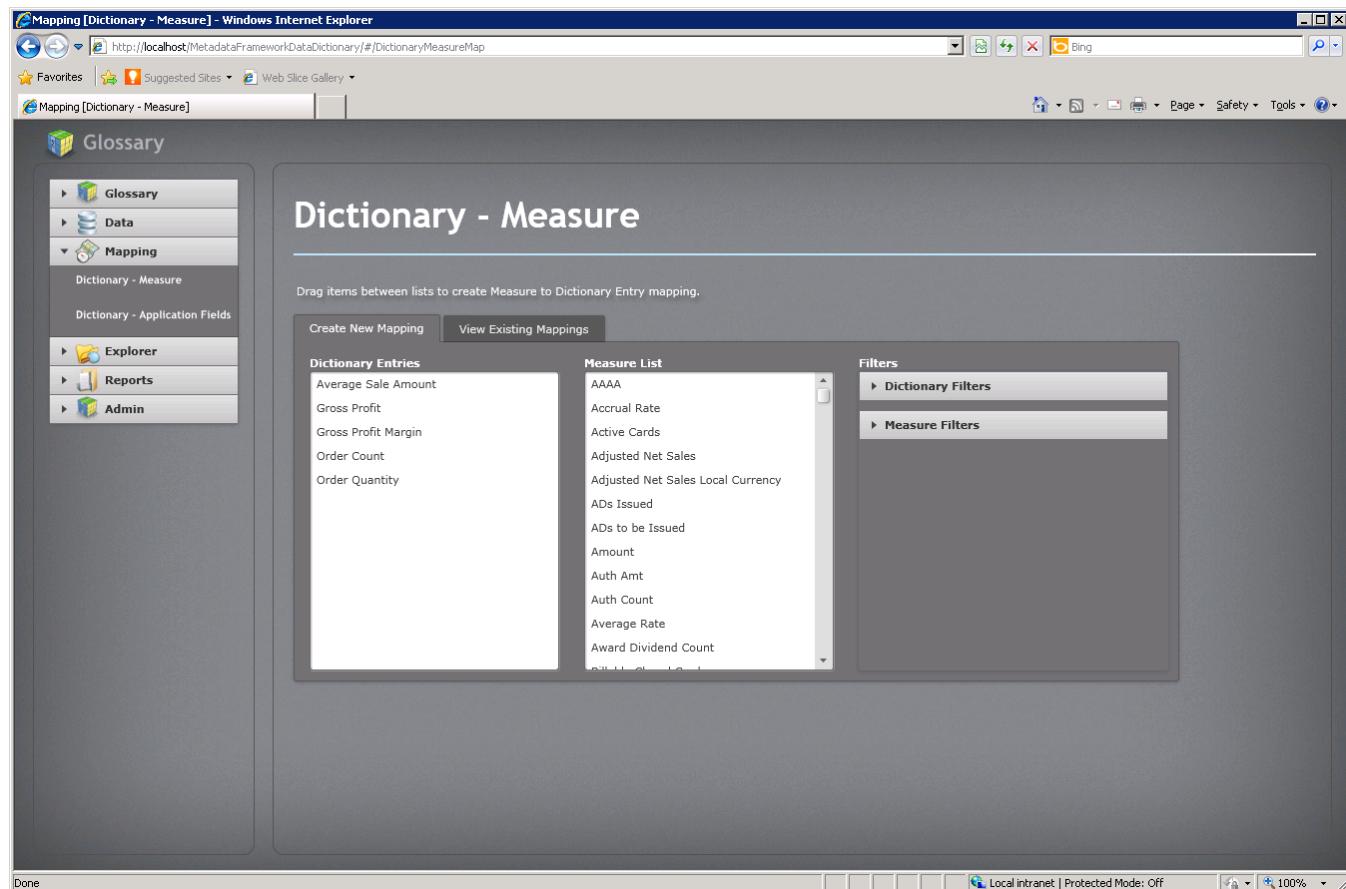
Table:	DW_Measure
Name:	Strategy Plan Amount
Path:	ContosoRetailDW Strategy Plan Strategy Plan Strategy Plan Amount
Contains:	N/A

The status bar at the bottom of the browser window indicates 'Local intranet | Protected Mode: Off' and shows the zoom level as '100%'.

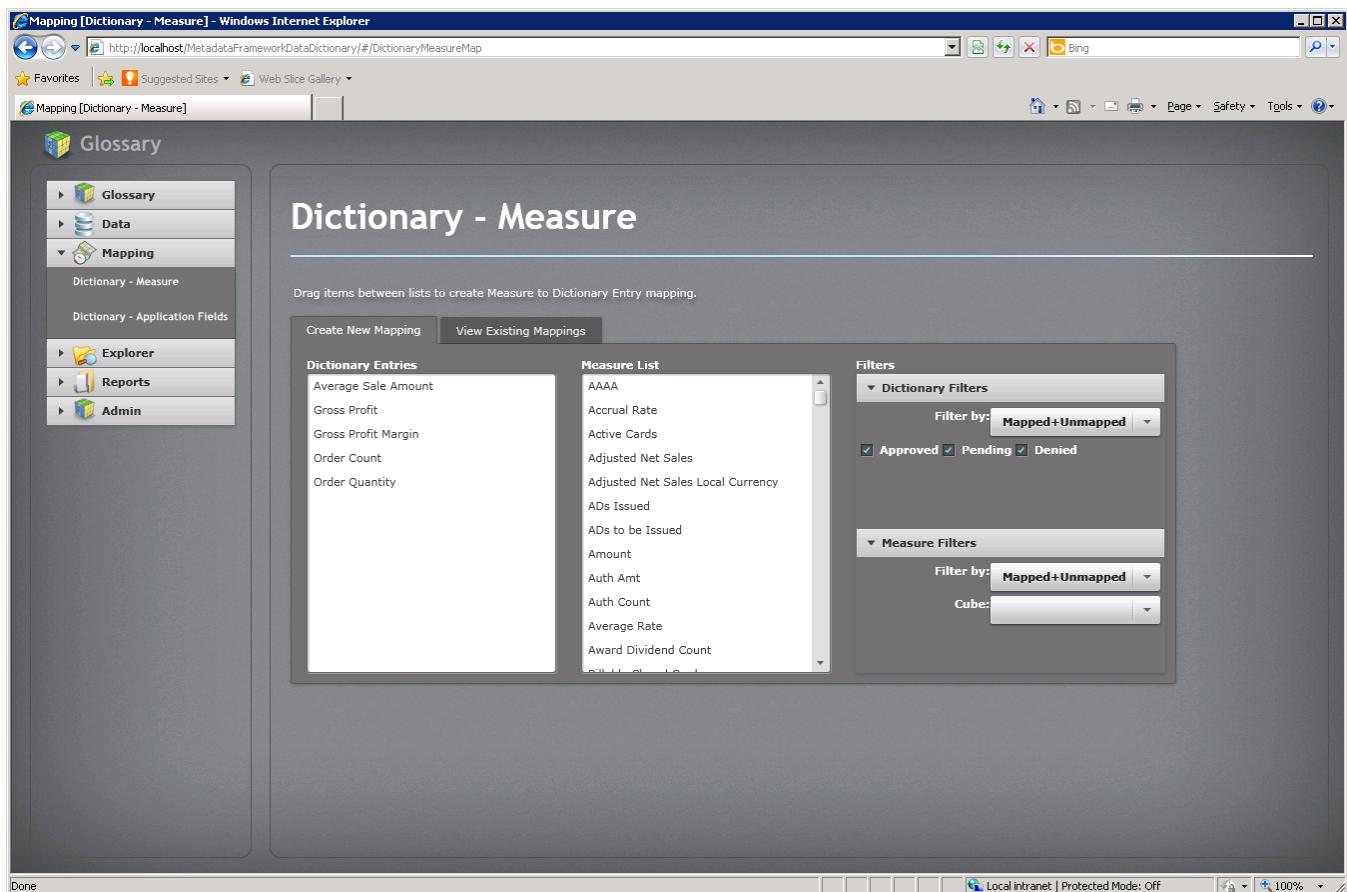


Mapping Options

The below screen is the default **Dictionary - Measure** screen. It contains two tabs, one to create a new mapping between Dictionary entries and Measure lists, and one to view the existing dictionary - measure mappings.



Click on the **Dictionary Filters** and **Measure Filters** links to expand the filtering options. We are currently showing all mapped and unmapped dictionary entries with any status (approved, pending, and denied). We are also showing all mapped and unmapped measures, from all cubes. To view a subset of the dictionary entries information chose the filtering options that you would like to see to filter the results. For example, to only see approved status mappings turn off the pending and denied options. To view mapped and/or unmapped measures from a single cube, selected either mapped, unmapped, or mapped + unmapped in the filter by drop down and select the cube from which to pull this information.



To see existing mappings click on the **View Existing Mappings** tab. This tab is a read-only view of the mappings that exist between the **Dictionary Entries** and the **Measure Names**. By clicking on a mapping its information is displayed on the right. Notice that we are viewing the **Gross Profit Margin** dictionary entry - **Active Cards** measure mapping information on the right.



The screenshot shows the 'Dictionary - Measure' page in the Metadata Framework Data Dictionary. The left sidebar includes links for Glossary, Data, Mapping, and Admin. The main content area displays a table of dictionary entries and a mapping details dialog box. The table has columns for 'Dictionary Entry' and 'Measure Name'. The mapping details dialog box contains fields for 'Measure Data Type' (set to Integer), 'Dictionary Data Type' (set to Decimal), and 'Business Definition' (set to '(Net Sales Amount / Product Cost) / Net Sales Amount').

Dictionary Entry	Measure Name
Gross Profit	AAAA
Gross Profit	Adjusted Net Sales
Gross Profit	Adjusted Net Sales Local Currency
Gross Profit	ADs to be Issued
Gross Profit	Decline Count
Gross Profit Margin	AAAA
Gross Profit Margin	Active Cards
Gross Profit Margin	Adjusted Net Sales
Gross Profit Margin	Adjusted Net Sales Local Currency
Gross Profit Margin	ADs Issued

Mapping Details

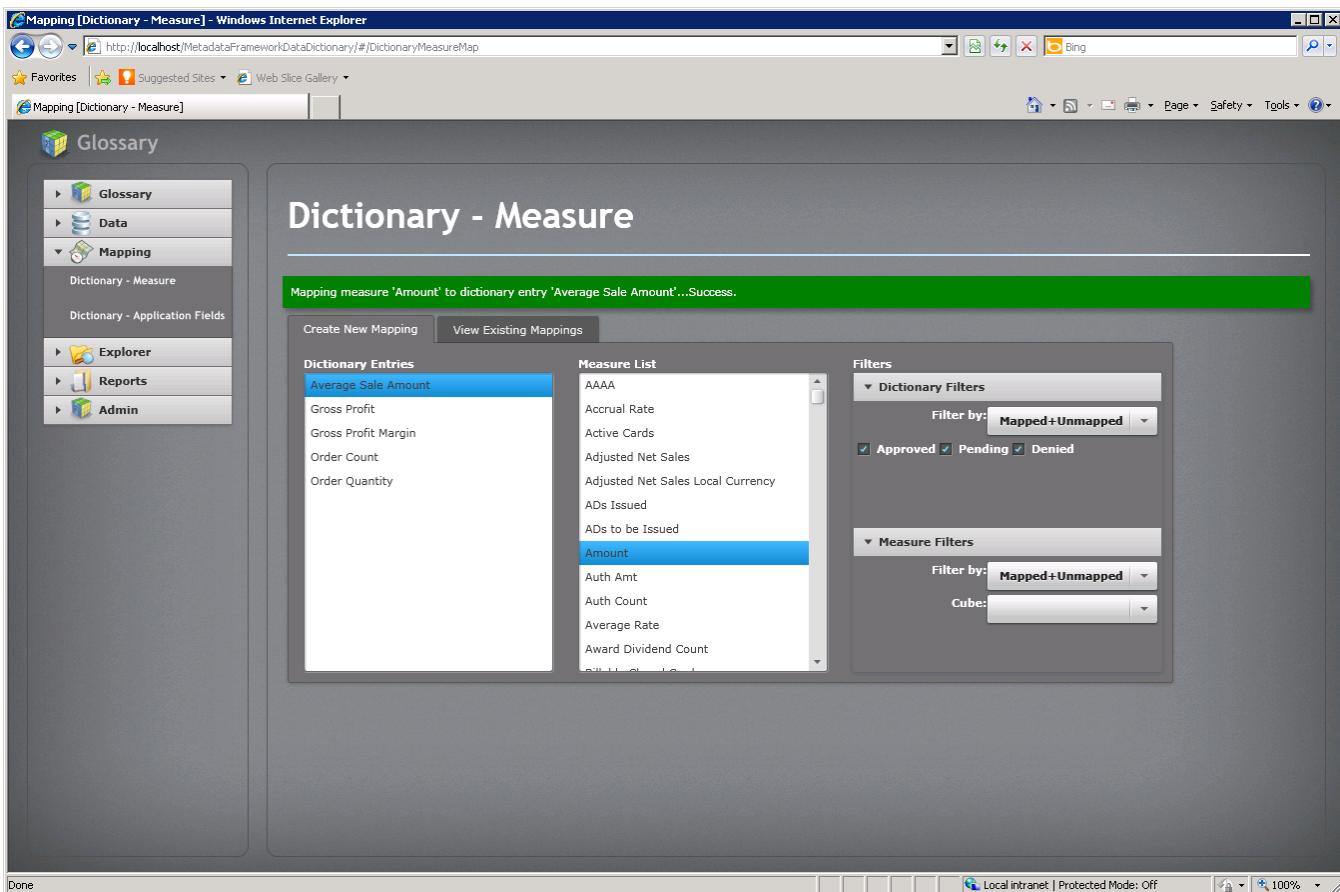
Measure Data Type: Integer

Description:

Dictionary Data Type: Decimal

Business Definition: (Net Sales Amount / Product Cost) / Net Sales Amount

To create a new mapping click the **Dictionary Entries** tab and drag a Dictionary Entry item over a Measure. In the example below I have dragged the **Average Sales Amount** dictionary entry over the **Amount** measure. The second screen shows the mapping information for this newly formed mapping.

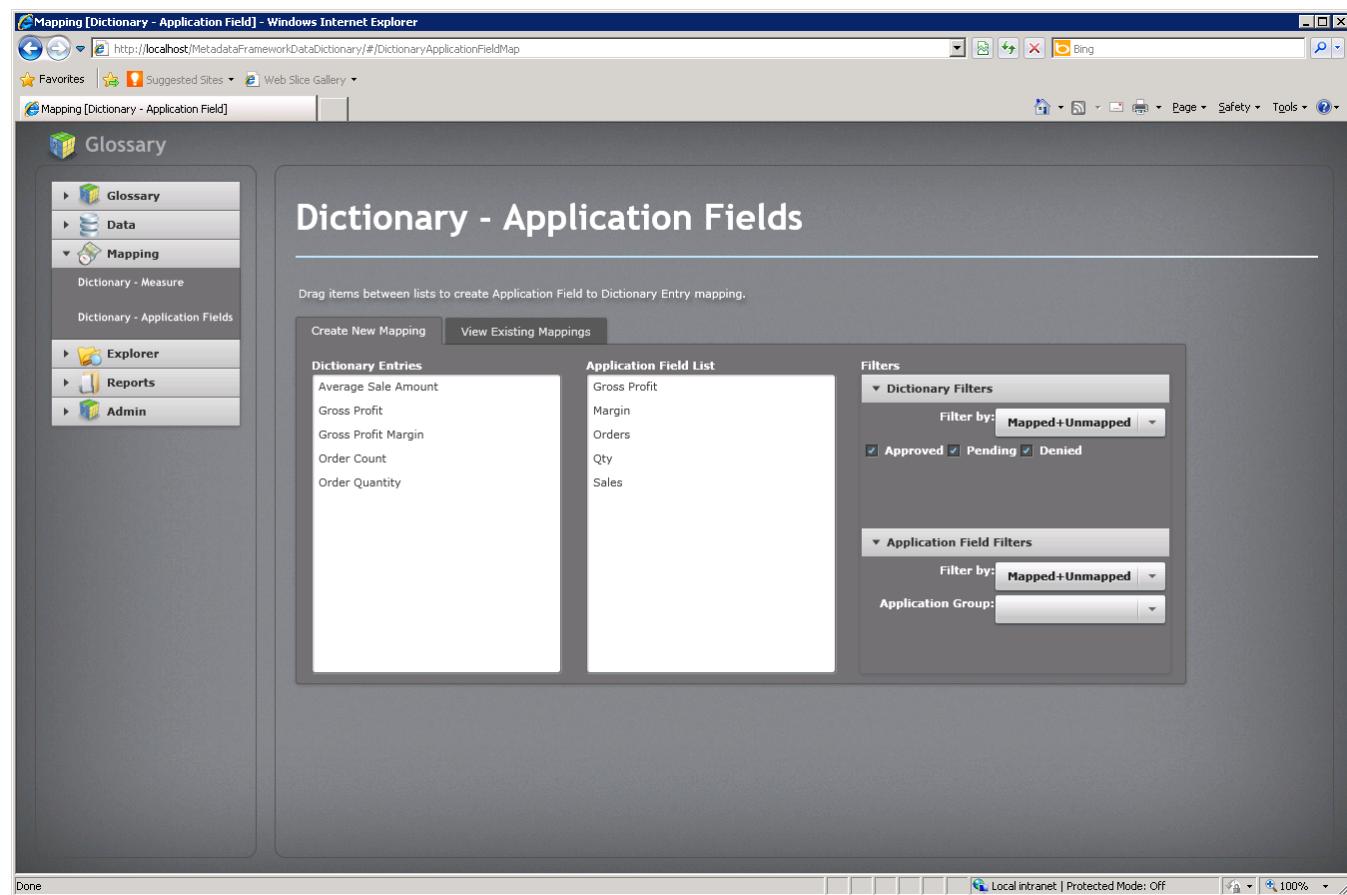


The screenshot shows a web browser window for 'Mapping [Dictionary - Measure] - Windows Internet Explorer' at the URL <http://localhost/MetadataFrameworkDataDictionary/#/DictionaryMeasureMap>. The page title is 'Dictionary - Measure'. The left sidebar includes links for 'Glossary', 'Data', 'Mapping', 'Dictionary - Measure', 'Dictionary - Application Fields', 'Explorer', 'Reports', and 'Admin'. The main content area displays a table titled 'Dictionary Entry' with columns 'Dictionary Entry' and 'Measure Name'. The table lists various measures, with 'Brvmt Used' currently selected. To the right of the table is a 'Mapping Details' dialog box. The dialog contains fields for 'Measure Data Type' (set to 'Double'), 'Description' (set to 'This is the description'), 'Dictionary Data Type' (set to 'Integer'), and 'Business Definition' (set to 'The total gross retail sales amount / by the total gross sales orders.'). Navigation buttons at the bottom of the table indicate 'Page 1 of 5'.

The following are screens for **Dictionary - Application Field** mapping.

Click on the **Dictionary Filters** and **Application Field Filters** links to expand the filtering options. We are currently showing all mapped and unmapped dictionary entries with any status (approved, pending, and denied). We are also showing all mapped and unmapped application fields, from all application groups.

To filter and map items, follow the same instructions as specified for mapping **Dictionary Entries** and **Measures** listed above.



The screenshot shows the 'Dictionary - Application Fields' mapping interface. On the left, a navigation sidebar includes 'Glossary', 'Data', 'Mapping' (which is expanded to show 'Dictionary - Measure' and 'Dictionary - Application Fields'), 'Explorer', 'Reports', and 'Admin'. The main content area is titled 'Dictionary - Application Fields' and contains two lists: 'Dictionary Entries' (with items: Average Sale Amount, Gross Profit, Gross Profit Margin, Order Count, Order Quantity) and 'Application Field List' (with items: Gross Profit, Margin, Orders, Qty, Sales). To the right of these lists are 'Dictionary Filters' and 'Application Field Filters' sections. The 'Dictionary Filters' section has a dropdown 'Filter by:' set to 'Mapped+Unmapped' and checkboxes for 'Approved', 'Pending', and 'Denied' status. The 'Application Field Filters' section has a dropdown 'Filter by:' set to 'Mapped+Unmapped' and a dropdown 'Application Group:'.

The screenshot shows a Windows Internet Explorer window with the title 'Mapping [Dictionary - Application Field] - Windows Internet Explorer'. The URL is 'http://localhost/MetadataFrameworkDataDictionary/#/DictionaryApplicationFieldMap'. The page is titled 'Dictionary - Application Fields' and displays a table of mappings between 'Dictionary Entry' and 'Application Field Name'. A modal window titled 'Mapping Details' is open, showing the following information:

Dictionary Entry	Application Field Name
Average Sale Amount	Gross Profit
Average Sale Amount	Gross Profit
Average Sale Amount	Sales
Gross Profit	Gross Profit
Gross Profit	Margin
Gross Profit Margin	Margin
Order Count	Orders
Order Quantity	Qty

Mapping Details

Field Description	Total Gross Profit
Dictionary Data Type	Integer
Business Definition	The total gross retail sales amount / by the total gross sales orders.



Data Options

The **Measures** screen under the Data option allows you to filter, view, edit, and map measures scraped from the databases in the organization. The screen below shows the default view of the Measures screen, showing all measures over twelve pages.

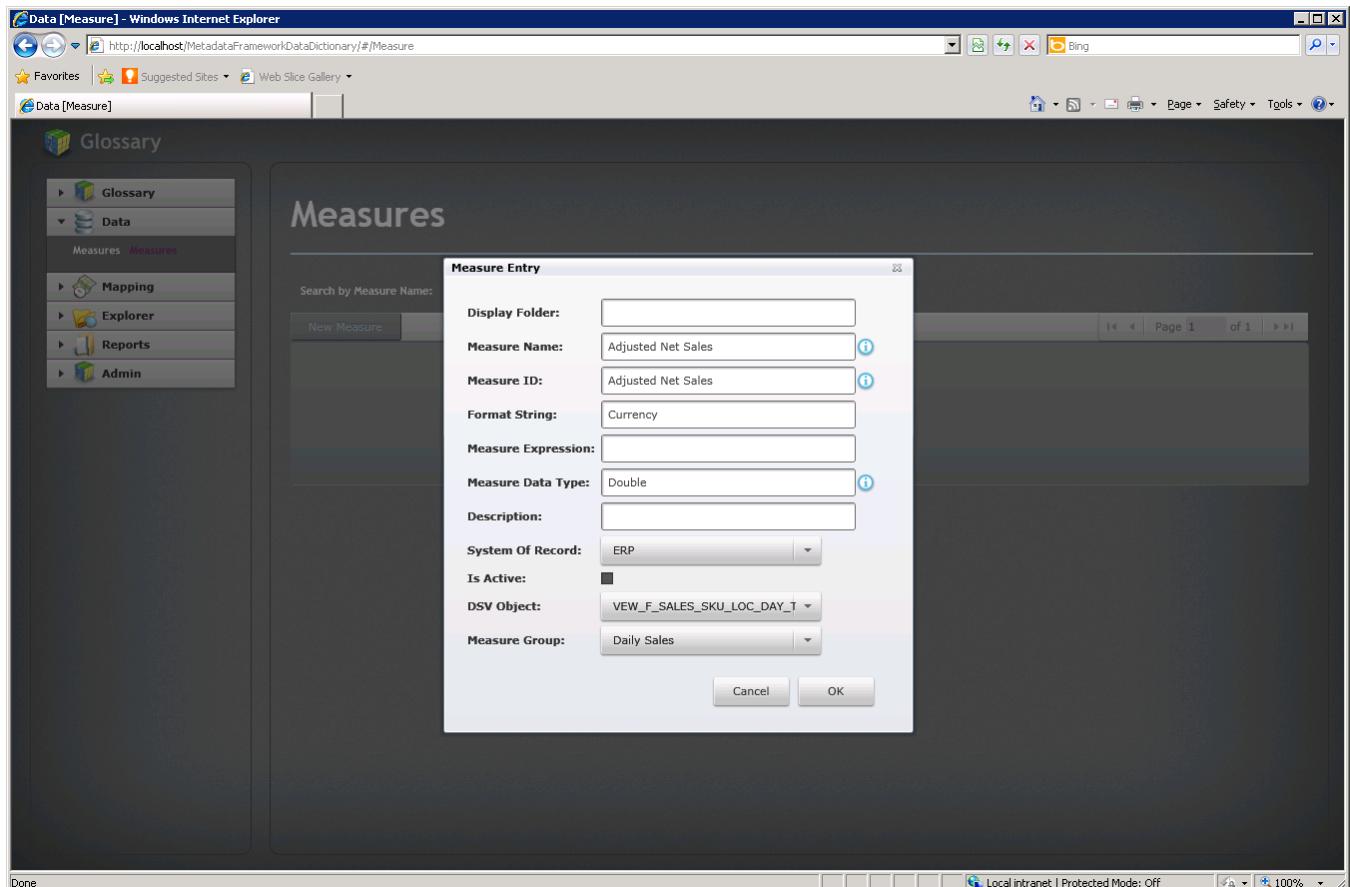
Measure	Display Folder	Format String	Data Type	Cube	Database	Edit	Map
AAAA	AAAA		string	Adventure Works	Adventure Works DW 2008	Edit	Map
Accrual Rate		#,#	Double	Retail	Clothing World	Edit	Map
Active Cards		#,#	Integer	EBCube	EBAnalysis2	Edit	Map
Adjusted Net Sales		Currency	Double	Retail	Clothing World	Edit	Map
Adjusted Net Sales Local Currency		Currency	Double	Retail	Clothing World	Edit	Map
ADS Issued		#,#	Integer	Retail	Clothing World	Edit	Map
ADS to be Issued		#,#	Integer	Retail	Clothing World	Edit	Map
Amount	Financial Amount	Currency	Double	Adventure Works	Adventure Works DW 2008	Edit	Map
Auth Amt		#,#.00	Double	EBCube	EBAnalysis2	Edit	Map
Auth Count		#,#	Integer	EBCube	EBAnalysis2	Edit	Map
Average Rate		#,#.00	Double	Adventure Works	Adventure Works DW 2008	Edit	Map
Award Dividend Count		#,#	Integer	Retail	Clothing World	Edit	Map
Billable Closed Cards		#,#	Integer	EBCube	EBAnalysis2	Edit	Map
Brvmt Used		#,#	Double	Retail	Clothing World	Edit	Map
CA To GB			Double	Retail	Clothing World	Edit	Map
CA To US			Double	Retail	Clothing World	Edit	Map
Card Count		#,#	Integer	EBCube	EBAnalysis2	Edit	Map

The following screen shows a subset of measures across all databases. In the example below, the letters **adju** have been entered into the search box and the filter was applied. Adjusted and Unadjusted measures have been retrieved and displayed in the results table. To clear the filter and view all measures, as in the screen above, click the **clear filter** button.

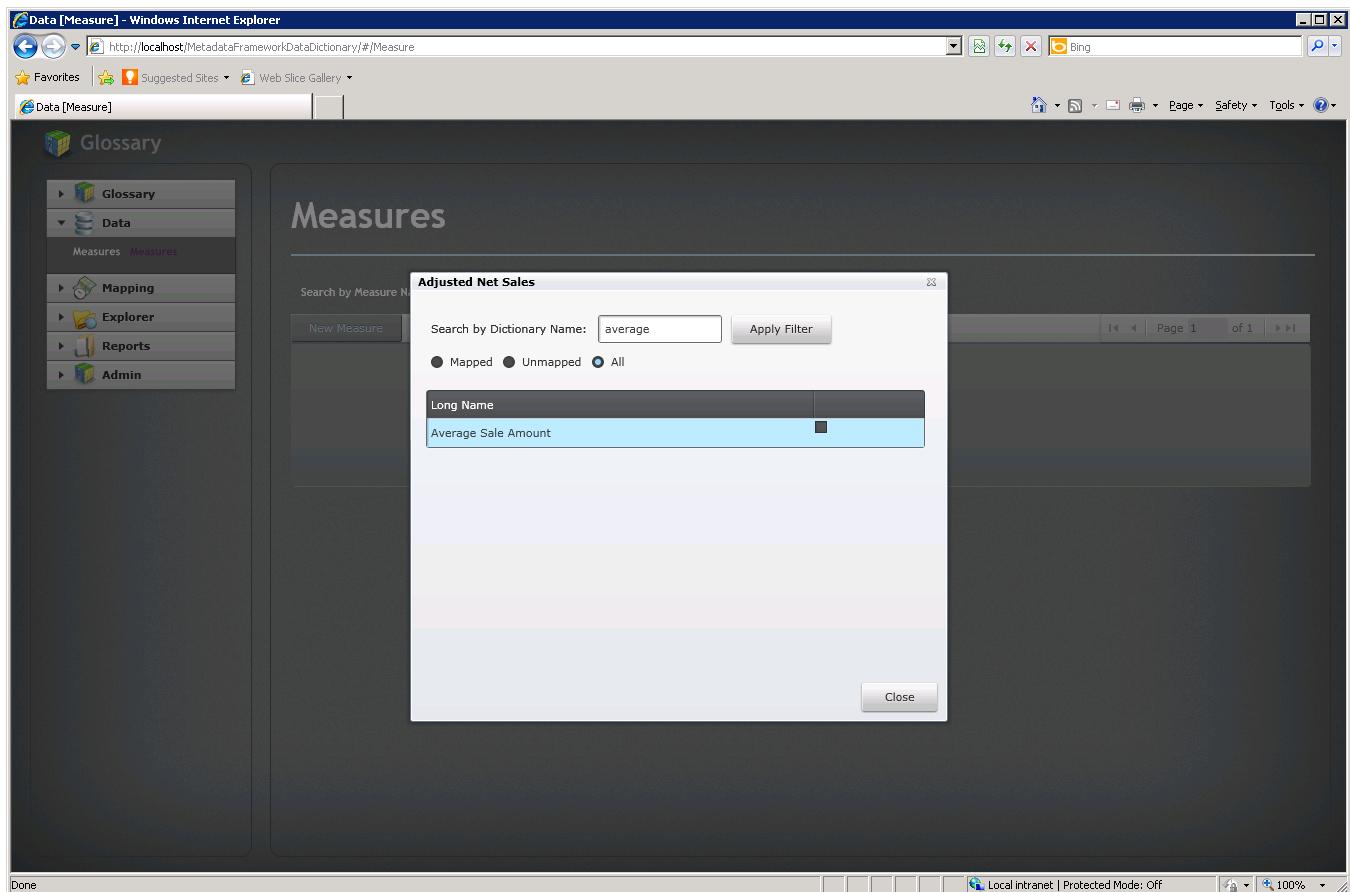


The screen below shows the edit screen for the first item in the filtered list, **Adjusted Net Sales**. This screen allows you to modify any of the information related to the measure. Some of the information that can be changes is the name and ID, description, whether or not it is active, and which measure group it belongs to, among other attributes.

If cancel is clicked then the original information is persisted. If OK is clicked after changes have been made the new information will be persisted.

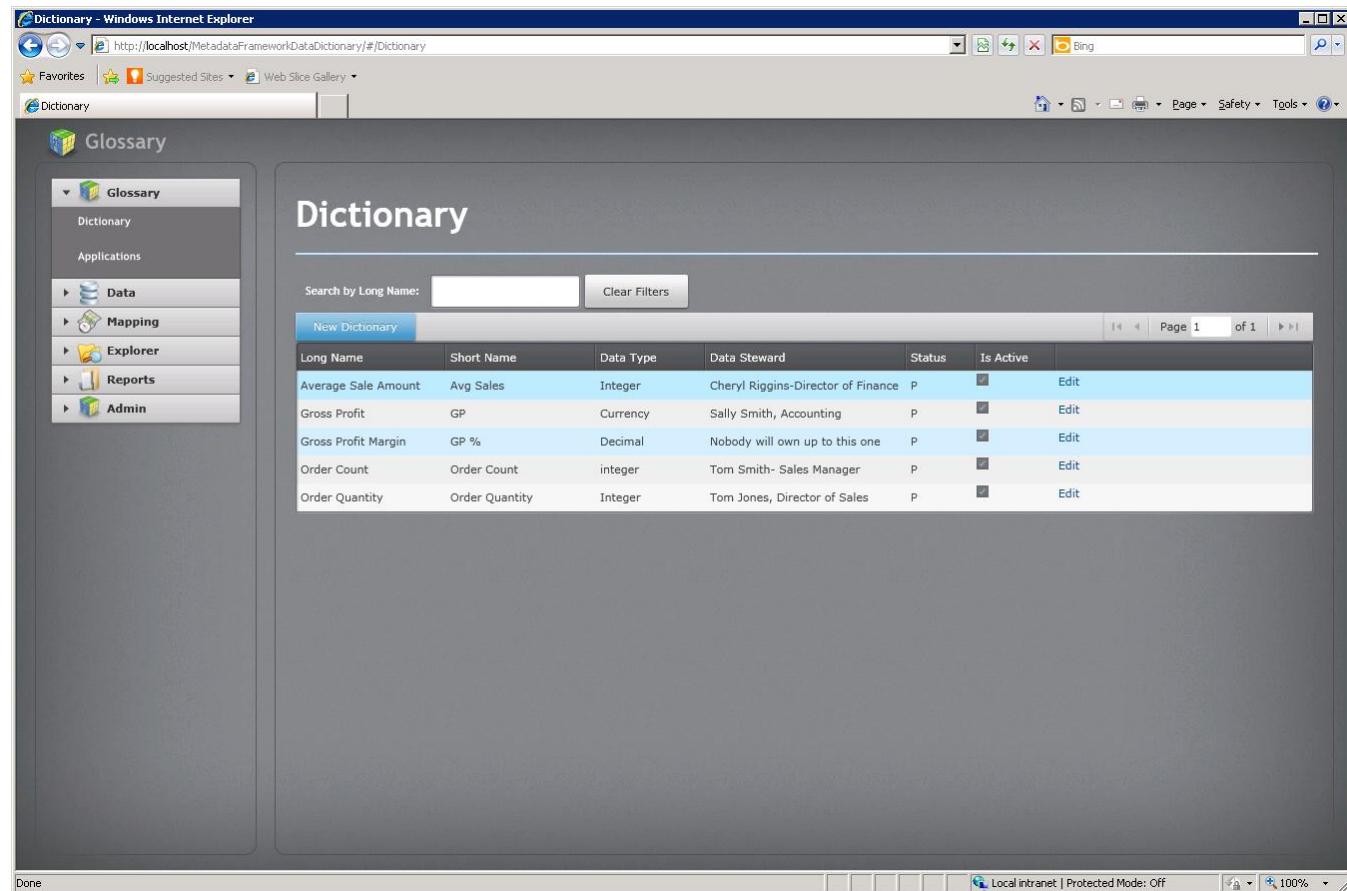


Mappings can take place from this screen. From the results table click the map hyperlink. This is the mapping screen for the first item in the filtered results, **Adjusted Net Sales**. In the screen below we have filtered the dictionary names to only display any dictionary name that contains the word average, whether or not it has been mapped (all option selected). To map the **Adjusted Net Sales** measure to the **Average Sale Amount** dictionary entry activate the checkbox to the right of the dictionary name and click the close button.



Glossary Option

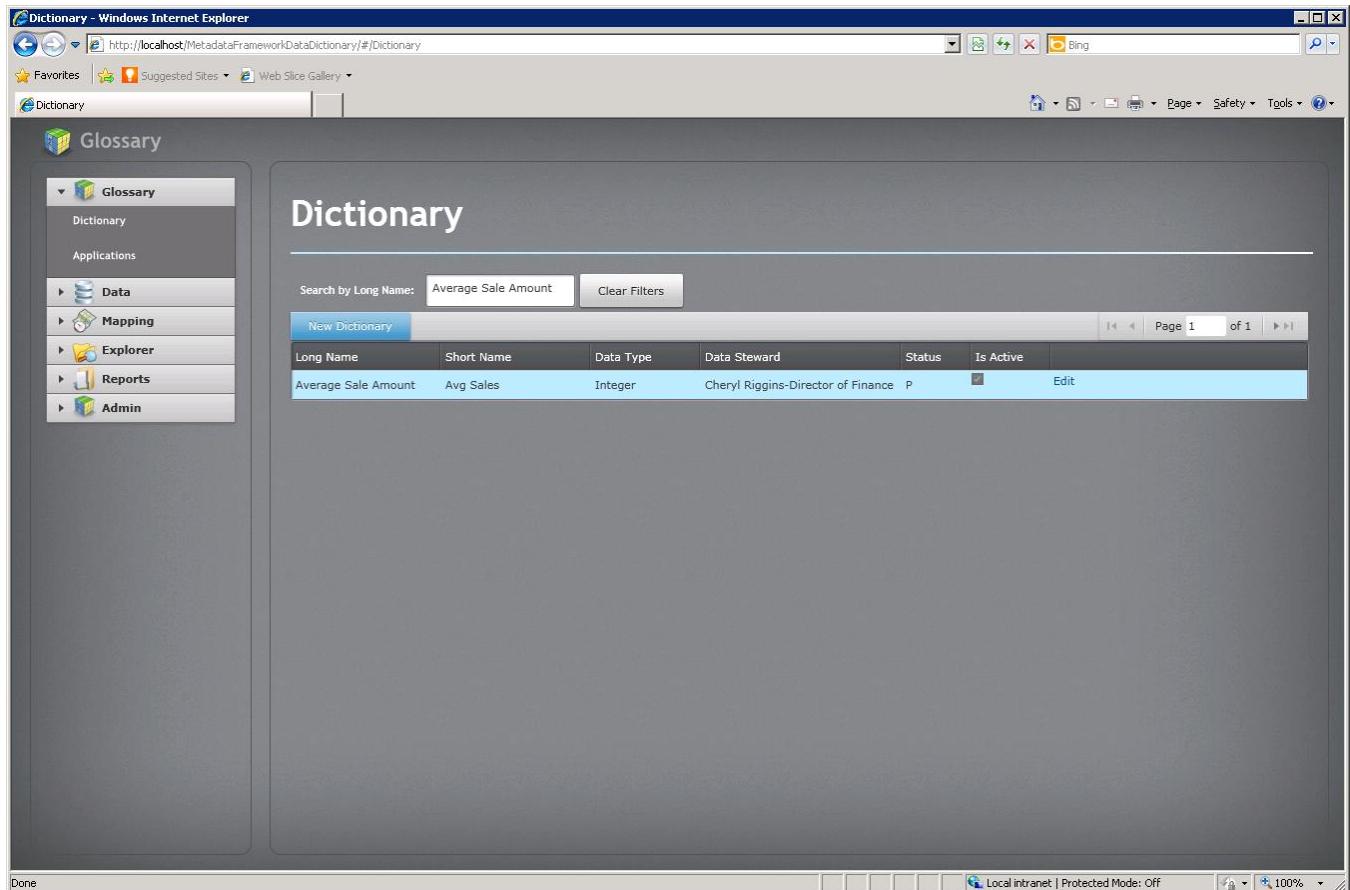
The **Dictionary** screen under the **Glossary** option shows all of the active and inactive dictionary entries in the Meta Data Dictionary. It also allows you to filter and edit entries in the dictionary results table.



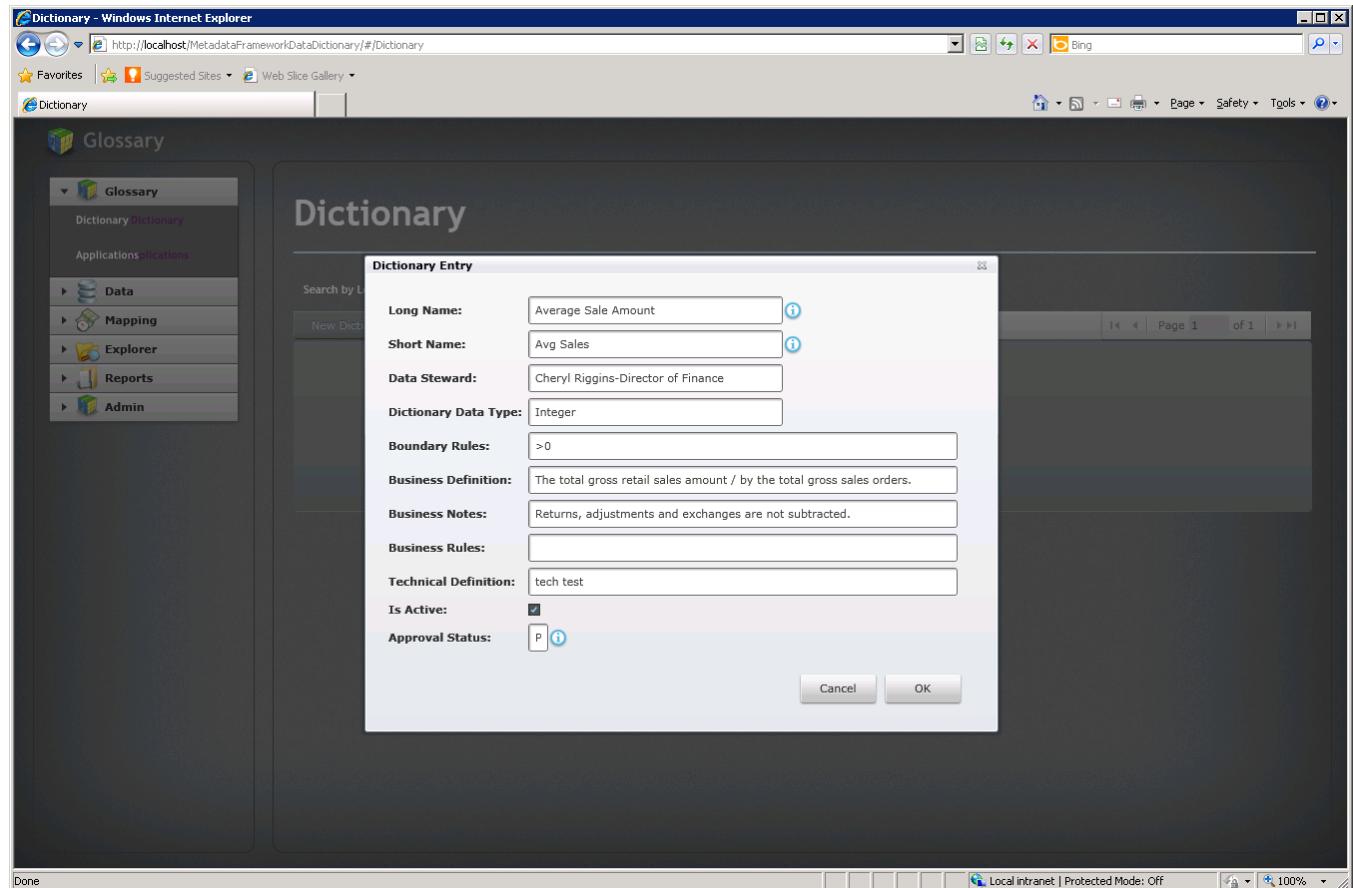
The screenshot shows a web browser window titled 'Dictionary - Windows Internet Explorer' with the URL 'http://localhost/MetadataFrameworkDataDictionary/#/Dictionary'. The browser interface includes a toolbar with icons for Back, Forward, Stop, Refresh, and Favorites, and a status bar at the bottom indicating 'Local intranet | Protected Mode: Off' and '100%'. The main content area is titled 'Dictionary' and contains a search bar with 'Search by Long Name:' and a 'Clear Filters' button. Below the search bar is a table with a header row: 'New Dictionary', 'Long Name', 'Short Name', 'Data Type', 'Data Steward', 'Status', 'Is Active', and 'Edit'. The table lists five dictionary entries:

Long Name	Short Name	Data Type	Data Steward	Status	Is Active	Edit
Average Sale Amount	Avg Sales	Integer	Cheryl Riggins-Director of Finance	P	<input checked="" type="checkbox"/>	Edit
Gross Profit	GP	Currency	Sally Smith, Accounting	P	<input checked="" type="checkbox"/>	Edit
Gross Profit Margin	GP %	Decimal	Nobody will own up to this one	P	<input checked="" type="checkbox"/>	Edit
Order Count	Order Count	integer	Tom Smith- Sales Manager	P	<input checked="" type="checkbox"/>	Edit
Order Quantity	Order Quantity	Integer	Tom Jones, Director of Sales	P	<input checked="" type="checkbox"/>	Edit

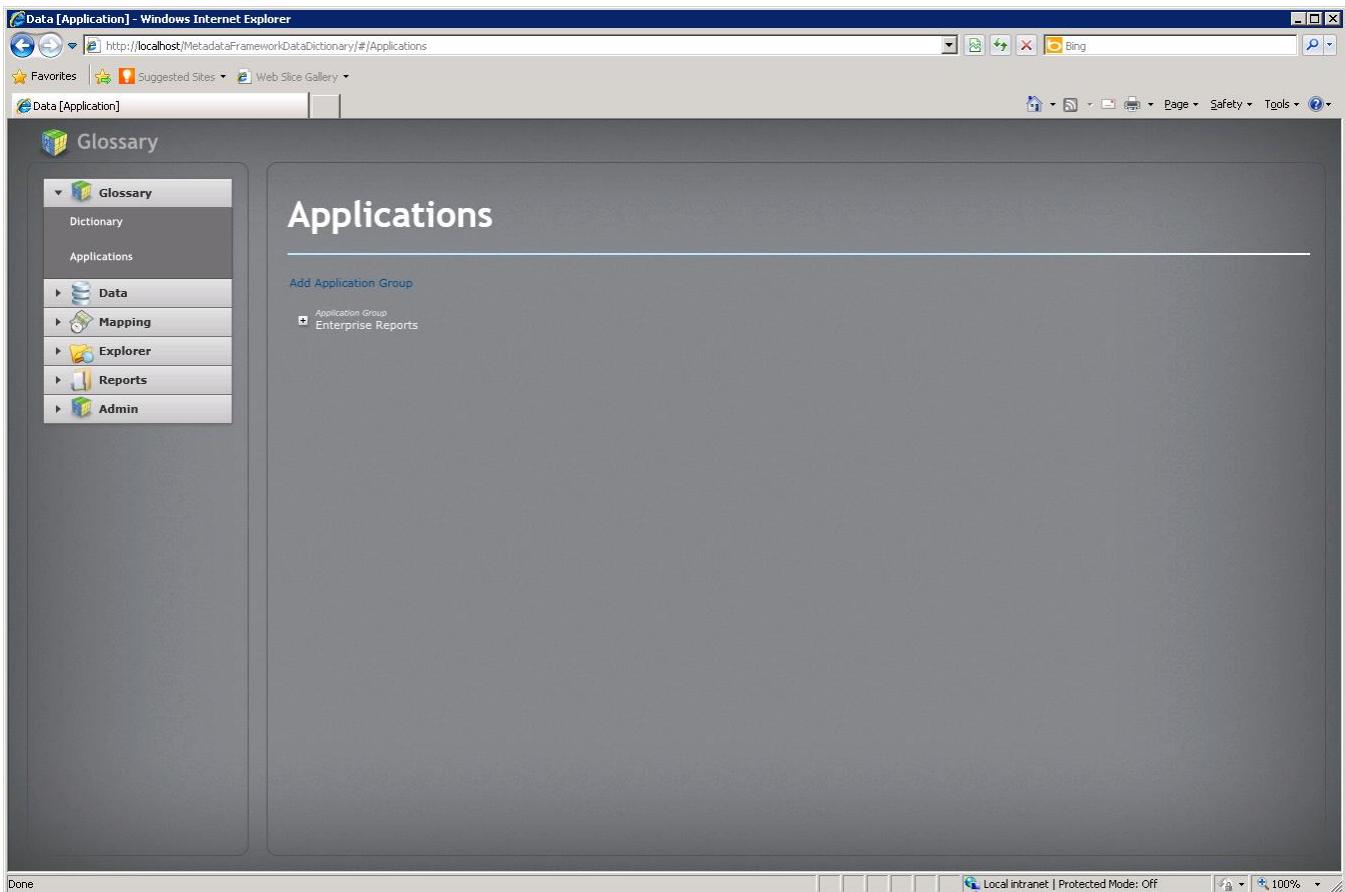
To filter the results in the table type in the name of the dictionary item to view. Below, we are filtering by the **Average Sales Amount** dictionary item.



Below is the edit screen for the **Average Sales Amount** dictionary item. Here, you can edit all of the attributes of the dictionary item. If you click cancel then the original data is persisted. If you click on OK after making a change, then the new information is persisted.



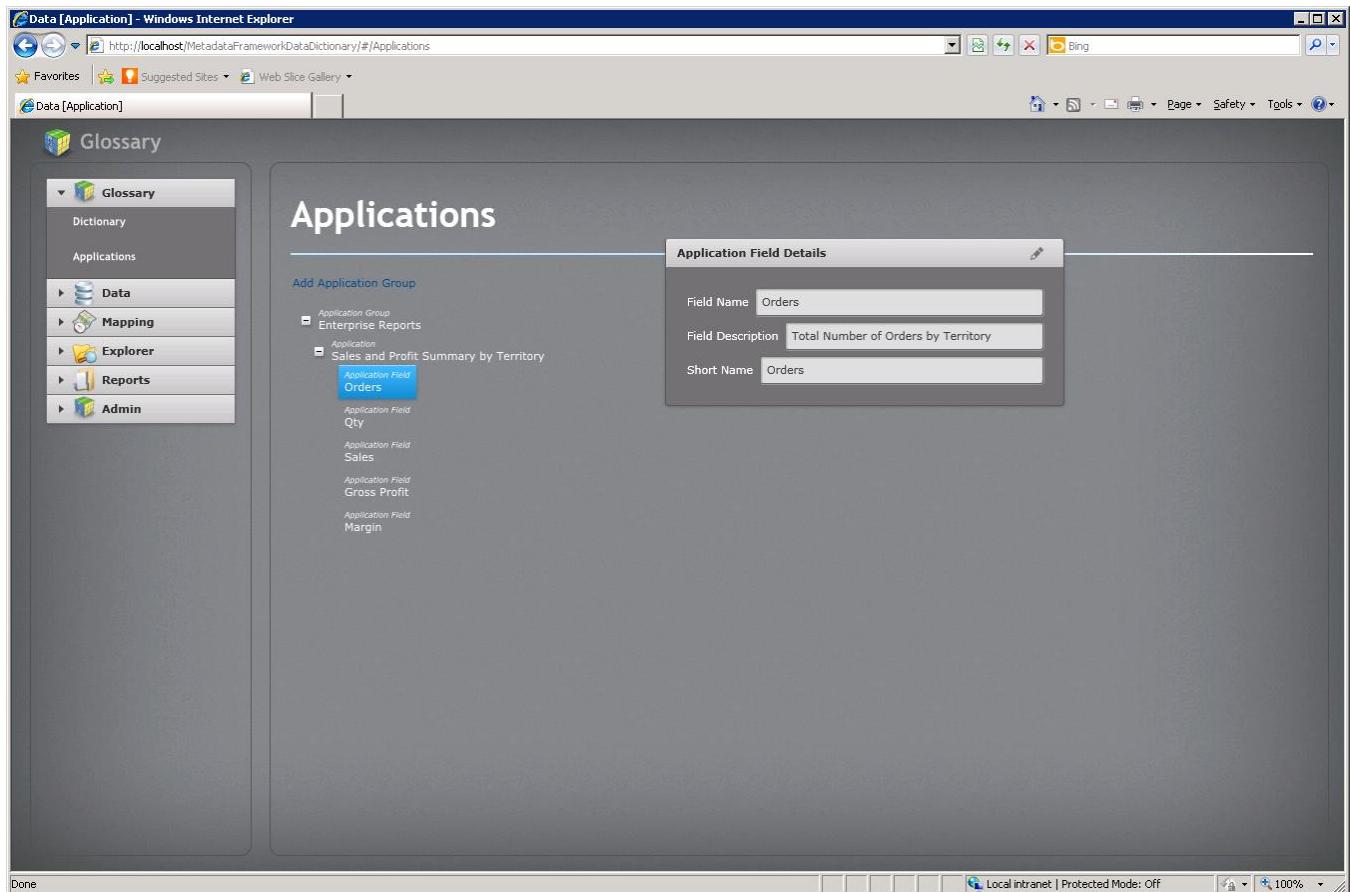
The default **Applications** screen of the Glossary option is below. It lists the master **Application Group** as the top level item in the tree structure.



Drilling down we see the following hierarchy:

- i. Application Group
 - a. Application
 - i. Application Field

Clicking on any object in the hierarchy brings up a summary box on the right hand side.



To edit the information click on the edit button on the upper right-and corner of the summary box. You can edit the information in the text boxes below. If you click on cancel the original information is persisted. If you click OK after making a change the new information is persisted.

